National Aeronautics and Space Administration

Educational Service	
Educators and Faculty	Grades: K – University

EP-1999-06-365-HQ

NASA CORE

Central Operation of Resources for Educators

Worldwide Distribution Center for Aerospace Education Materials

Educational Materials Catalog

Sponsored by:
National Aeronautics and Space Administration
Washington, DC
and
Lorain County JVS
15181 Route 58 South
Oberlin, Ohio 44074

The NASA Core Educational Materials Catalog is available in electronic format through NASA Spacelink—one of the Agency's electronic resources specifically developed for use by the educational community.

This catalog may be accessed at the following address:
http://spacelink.nasa.gov/products

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Services and Ordering Information

About Our Services

The NASA Central Operation of Resources for Educators (CORE), established in cooperation with Lorain County Joint Vocational School, serves as the worldwide distribution center for NASA-produced educational materials. For a minimal charge, CORE will provide a valuable service to educators unable to visit one of the NASA Educator Resource Centers by making NASA educational audiovisual materials available through its mail order service.

Through CORE's distribution network, the public has access to more than 200 videocassette, slide, and CD–ROM programs, chronicling NASA's state-of-the-art research and technology. Through the use of these curriculum supplement materials, teachers can provide their students with the latest in aerospace information. NASA's educational materials on aeronautics and space provide a springboard for classroom discussion of life science, physical science, astronomy, energy, Earth resources, environment, mathematics, and career education.

Additional information about CORE can be obtained by calling the CORE office at (440) 775-1400, weekdays between 8:00 a.m. and 4:00 p.m. (Eastern Standard Time) or writing on school letterhead. We can also be reached through our web site at *http://core.nasa.gov* or by e-mail to *nasaco@leeca.esu.k12.oh.us*.

How to Use This Catalog

Materials are divided by media type and subject. The videocassettes are classified by subject in the general topic section and by series title in the multiple-part series section. All multiple-part series are available by individual 30-minute programs or in complete condensed sets. For example, the 14-part series "Journey Through the Solar System" is available on 14 separate 30-minute videocassettes or as a complete series condensed onto four videocassettes. A considerable savings is made by purchasing the condensed series versus purchasing each videocassette individually. The prices of multiple-part series condensed sets are subject to change without notice as additional episodes are added to the series. Please note that condensed multiple series are only available in 1/2-inch VHS.

Preview Sites

NASA's Educator Resource Centers function as an information network serving educators nationwide. These centers are located at each of the NASA Field Centers, selected museums, and universities throughout the United States. Educators can preview audiovisual materials at these centers prior to placing orders through CORE. A listing of the NASA Educator Resource Centers is provided for your convenience at the back of this catalog.

No Return Policy

CORE regrets that it cannot accept the return of audiovisual materials unless they are defective or were shipped in error. CORE staff are available to answer questions about materials, prior to your purchase, to help you make an informed decision. Damaged or defective products must be returned to CORE within 21 days from the date of shipment.

Special Formats

Special orders for broadcast quality formats (Betacam, SVHS, Umatic) can be processed. Contact the NASA CORE office for pricing information.

How to Order

The materials listed in this catalog are distributed by the NASA Central Operation of Resources for Educators (CORE). Use the convenient order form at the back of this catalog and return to:

NASA CORE
Lorain County Joint Vocational School
15181 Route 58 South
Oberlin, OH 44074

E-mail: *nasaco@leeca.esu.k12.oh.us*
World Wide Web: *http://core.nasa.gov*

Please help us fill your order promptly and accurately by providing the title, format, and item number for each selection. If paying cash, please submit payment with your order. Make checks payable to Lorain County JVS-NASA CORE. If you prefer to be billed, include an official purchase order with your request. VISA and MasterCard are also accepted. Prices and shipping charges are subject to change without notice. Special handling or additional shipping charges are to be paid by the user.

Delivery Time

Delivery for material is normally made in 4 weeks after receipt of your order. Expedited orders are available by paying additional charges and contacting the NASA CORE office.

International Orders

International orders are subject to additional shipping and customs charges. Please contact the NASA CORE office regarding these charges. Advance payment in U.S. currency is required on all international orders. Shipping charges must be included in the advance payment.

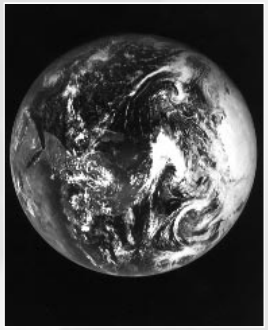
Special Note

Space technology changes at a rapid pace. The programs in this catalog were current and accurate at the time they were made; later events, however, may have caused some parts to become outdated. The information remains a part of the history of the space program and is available to interested viewers in its present form.

Revised September 1999

Videocassettes—General Topic





	Format	Item No.	Price

America's Wings

28 minutes/1976 | 1/2" VHS | 001.0-01V | **16.00**
Level: Grades 9–Adult

Discusses aerodynamics and airplane wing design. Presents commentaries from key research personnel whose contributions were historically significant in the development of the modern airplane wing: Igor Sikorsky, who invented the helicopter; James Osborne, whose small suggestion helped make jet transports flyable; Eastman Jacobs, whose wind tunnel work in the 1930's established the shape of airfoils; Adolph Busemann, who thought of the swept wing; Kelly Johnson, who designed 40 airplanes; and Richard Whitcomb, who conceived the idea for the supercritical wing, the "coke-bottle" fuselage, and the winglet.

Space Research & You: Your Health, Your Transportation

28 minutes/1981 | 1/2" VHS | 001.0-02V | **16.00**
Level: Grades 11–Adult

Consists of two short programs. The first, "Space Research and Your Health," depicts a variety of medical advances made possible with the technology developed for the U.S. space programs. The second, "Space Research and Your Transportation," examines NASA research and its impact on land, sea, and space travel.

A Man's Reach Should Exceed His Grasp

23 minutes/1972 | 1/2" VHS | 001.0-03V | **16.00**
Level: Grades 4–9

Presents the story of flight and our reach for new freedom through aviation and the exploration of space. From the Wright Brothers' flight at Kitty Hawk to the landing on the Moon and future missions to the planets, the tape depicts the fulfillment of the ancient dream of flight. Through the use of multiple images, the creative role of research is emphasized. Voices of scientists and statements by writers, poets, and philosophers document our search for knowledge. Narrated by Burgess Meredith.

Flying Machines

28 minutes/1978 (open captioned) | 1/2" VHS | 001.0-04V | **16.00**
Level: Grades 9–Adult

Flying Machines

28 minutes/1978 | 1/2" VHS | 001.0-05V | **16.00**
Level: Grades 9–Adult

Examines aviation as it exists today and the technological advances that will impact aviation in the future. The tape briefly describes wind tunnels, power plants, safety, comfort, economy, and noise abatement. NASA aeronautical research has answered some tough questions and is looking forward to solving current problems innovatively.

Opening New Frontiers: The Orbital Flight Tests of the Space Transportation System

28 minutes/1982 | 1/2" VHS | 001.0-06V | **16.00**
Level: Grades 4–10

Covers the first four test missions of the Space Shuttle Columbia, STS flights 1, 2, 3, and 4. Also includes events leading up to the first launch, President Reagan's speech after the fourth landing, and highlights of the Orbital Flight Test Program.

Milestones of Flight

25 minutes/1988 | 1/2" VHS | 001.0-07V | **16.00**
Level: Grades 4–10

Produced by the National Air and Space Museum and based on the museum's "Milestones of Flight" Gallery, traces the history of flight from Langley's first attempts to the Space Shuttle. Uses live footage from many history-making events.

	Format	Item No.	Price

Transformations of Flight

5 minutes/1989 — 1/2″ VHS — 001.0-09V — **10.00**
Level: Grades K–3

Presents ten important air- and spacecraft in the history of flight. Serves as an intriguing invitation to explore the history of aviation from the Wright Brothers' flight to the Space Shuttle program. This animated videotape successfully complements the "Transformations of Flight" slide set also available from this catalog. Includes a lesson guide. Produced by the Smithsonian Institution.

The X-15: 1960–1980

5 minutes/1980 — 1/2″ VHS — 001.0-10V — **10.00**
Level: Grades 9–Adult

Examines the prominent features of the rocket-powered X-15 research airplane. Briefly discusses how the X-15 was the forerunner to the Space Shuttle.

Aeronautical Oddities

17 minutes/1979 — 1/2″ VHS — 001.0-11V — **15.00**
Level: Grades 7–Adult

Documents with old news reels the successes and failures of early aviation oddities, including: a windmill plane, flying barrel, spindle plane, potato bug, tailless airplane, aerobike, ornithopter, sky-car, rocket glider, and more.

Reduced Gravity Program

9 minutes/1990 — 1/2″ VHS — 001.0-12V — **10.00**
Level: Grades 9–Adult

Shows how NASA's KC-135 turbo-jet aircraft provides the scientific community with a weightless research environment. Highlights the types of experiments frequently conducted and explains the flight pattern the "Weightless Wonder" uses to create a zero-gravity environment.

Test Flights Beyond the Limits

150 minutes/1999 — 1/2″ VHS — 001.0-13V — **24.00**
Level: Grades 7–Adult

Presents an entertaining and compelling story of the world of flight test and research. Three 47-minute programs combine exciting aerial footage of unique research aircraft and insightful interviews with pilots and engineers to tell the inspiring and sometimes dangerous story of flight research.

Program 1: Flights of Discovery
From the X-15 to testing of the new X-33 engine, learn what drives NASA's modern-day explorers to go beyond tragedy, to find answers, and push the edges of flight where no one has gone before.

Program 2: The Need for Speed
Witness how pilots and crews meet the challenges of supersonic flight with planes such as the X-1 and SR-71 and explore the new technologies of the X-43 and High Speed Civil Transport which may open a new world of unprecedented speed.

Program 3: The New Frontier
Experience how current computer technology is changing how we fly. From the radical looking X-29 to the amazing thrust vectoring X-31, explore how computer developments can improve safety and deliver undreamed of performance.

	Format	Item No.	Price

Growing Concerns

15 minutes/1976 | 1/2″ VHS | 002.2-01V | **15.00**
Level: Grades 10–Adult

Introduces the Landsat satellite as a partial solution to the world's need to survey and monitor agricultural resources. Imagery is being used experimentally to supplement U.S. ground surveys in an effort to increase the accuracy of estimates of crop production and inventory. Three government agencies are cooperating in the Large Area Crop Inventory Experiment to see how Landsat can be used to estimate crop production on a worldwide basis. By providing a comprehensive view of forest lands, the satellite can help improve management in the area of forestry. Satellite imagery can also help control insect destruction of crops and trees by pinpointing infested areas for spraying.

Landsat, The Pollution Solution

15 minutes/1976 | 1/2″ VHS | 002.2-02V | **15.00**
Level: Grades 10–12

Depicts the complications that pollution has caused for three individuals living in different parts of the world. Outlines the variety of uses for satellites in the fields of communication, meteorology, agriculture, and monitoring of Earth resources.

Space Research & You: Your Home and Environment

15 minutes/1981 | 1/2″ VHS | 002.2-03V | **15.00**
Level: Grades 9–12

Discusses several examples of how NASA space research continually assists in improving our homes and environment: Landsat studies of Earth for examining natural resources and detecting pollution, advanced technology for solar/wind energy, innovative sewage treatment facilities, and energy-saving household devices.

The Wet Look

15 minutes/1976 | 1/2″ VHS | 002.2-04V | **15.00**
Level: Grades 9–12

Explores Landsat's remote-sensing capability and how it helps solve water resource problems. Landsat provides information to hydrologists about snowfall in the mountains, enabling them to estimate the basic water supply available to western states and predict spring runoff and flooding.

Mineral Exploration

29 minutes/1987 | 1/2″ VHS | 002.2-05V | **16.00**
Level: Grades 11–Adult

Examines the use of remotely sensed data in mineral exploration. Focuses on finding the most promising location for a mining operation.

Vegetation Assessment

30 minutes/1987 | 1/2″ VHS | 002.2-06V | **16.00**
Level: Grades 11–Adult

Highlights a series of discussions between the Earth Resources Observation System (EROS) scientists and fictitious power company officials. The discussion focuses on using remote satellite sensing to select a route across the State of South Dakota for a power line.

	Format	Item No.	Price
Sentinels in Space: The Environmental Satellites			
29 minutes/1987 Level: Grades 9–12	1/2″ VHS	002.2-07V	**16.00**

Produced by the National Oceanic and Atmospheric Administration (NOAA), this program explains how satellites monitor Earth conditions.

Earth Symphony			
29 minutes/1987 Level: Grades 11–Adult	1/2″ VHS	002.2-08V	**16.00**

Displays (first half of program) pictures of aerial photography taken from the Landsat satellite set to the music of Vivaldi, "The Four Seasons." Also has the theme (second segment) of "Space—A New Place To Work," featuring footage from various Shuttle flights also presented with a musical background.

Portrait of Earth: The Story of Satellites			
30 minutes/1981 (captioned at the 2nd grade level) Level: Grades 4–8	1/2″ VHS	002.2-09V	**16.00**
Portrait of Earth: The Story of Satellites			
30 minutes/1981 (captioned at the 3rd grade level) Level: Grades 4–8	1/2″ VHS	002.2-10V	**16.00**
Portrait of Earth: The Story of Satellites			
30 minutes/1981 (captioned at the 4th grade level) Level: Grades 4–8	1/2″ VHS	002.2-11V	**16.00**

Explains what satellites are and how they perform their daily tasks in orbit around our planet. In the fields of communications, meteorology, and Earth resources, they provide domestic and worldwide communications and early warning of hurricanes and forest fires. Satellites also monitor pollution, marine resources, oceanography, land use, and agriculture.

Landsat: 15 Years of Learning			
8 minutes/1987 Level: Grades 9–Adult	1/2″ VHS	002.2-12V	**10.00**

Offers a brief look at the history of the Landsat satellite and how it helps scientists study Earth's environment.

TOPEX/POSEIDON: A Mission to Planet Earth			
9 minutes/1992 Level: Grades 9–Adult	1/2″ VHS	002.2-13V	**10.00**

Explains the objectives of the joint U.S./French mission dedicated to the study of the circulation of Earth's oceans. This satellite will vastly improve our understanding of the ocean's role in global climate change and lay the foundation for long-term ocean monitoring from space.

	Format	Item No.	Price

Liftoff to Learning: The Atmosphere Below

16 minutes/1992 | 1/2" VHS | 002.2-14V | **15.00**
Level: Grades 5–12

Shows that changes in Earth's atmosphere are investigated from outer space on board the Shuttle using the Atmospheric Laboratory for Applications and Science (ATLAS 1). Space Shuttle astronauts explain the questions scientists hope can be answered by studying Earth's atmosphere from space. Experiments discussed in this videotape focus on infrared detection of atmospheric remnants from volcanic eruptions, ozone concentration levels, and incoming solar ultraviolet radiation with respect to global warming, among others.

Blue Planet

42 minutes/1990 | 1/2" VHS | 002.2-15V | **30.00**
Level: Grades 4–Adult

Filmed by astronauts from five Space Shuttle missions with the IMAX camera, dramatically reveals the forces affecting Earth's fragile ecological balance: volcanoes, hurricanes, earthquakes, and, ultimately, humankind. Copyrighted by the Smithsonian Institution/Lockheed Corporation. For noncommercial private use only. Available in 1/2" VHS format only.

Glacier Bay, Alaska From the Ground, Air and Space

13 minutes/1996 | 1/2" VHS | 002.2-16V | **15.00**
Level: Grades 7–12

Demonstrates how satellite data can be used to measure glacier changes from space. Also explains how remote sensing can extend the records of historical ground-based measurements to the present. Examines how ground and satellite measurements can be integrated to yield information that may be used in the analysis of regional climate.

The GLOBE Program

10 minutes/1996 | 1/2" VHS | 002.2-17V | **10.00**
Level: Teachers

Presents a short overview of the Global Learning and Observations to Benefit the Environment (GLOBE) program. The GLOBE program is a hands-on international environmental science and education program that links students, teachers, and the scientific research community to learn more about our environment through student data collection and observation. Intended to provide general information for teachers about the objectives and logistics of GLOBE. For more information, visit the GLOBE Home Page at http://www.globe.gov.

Sun Splash Ozone Video

8 minutes/1997 | 1/2" VHS | 002.2-18V | **10.00**
Level: Grades 9–12

Uses computer graphics and animation to illustrate ozone depletion, explains how ozone in the stratosphere protects us from ultraviolet radiation, and demonstrates how chlorofluorocarbons (CFC's) cause destruction of Earth's protective ozone layer.

	Format	Item No.	Price

Earth Science Elementary Publication Packet

Level: Grades K–3 | Packet | 002.2-19P | 6.00 shipping *(or free with any order)*

Includes the following print materials:

Our Mission to Planet Earth: A Guide to Teaching Earth Science
Earth Observing System (EOS) Science Posters
NASA Earth Science Fact Sheets:
- *Biosphere*
- *Clouds and the Energy Cycle*
- *El Niño*
- *Global Warming*
- *Ozone: What is it and why do we care about it?*
- *Polar Ice*
- *Volcanoes and Global Climate Change*

Earth Science Middle School/Secondary Publication Packet

Level: Grades 5–12 | Packet | 002.2-20P | 6.00 shipping *(or free with any order)*

Includes the following print materials:

Looking at Earth From Space Teacher's Guide with Activities for Earth and Space Science
Earth Observing System (EOS) Science Posters
NASA Earth Science Fact Sheets:
- *Biosphere*
- *Clouds and the Energy Cycle*
- *El Niño*
- *Global Warming*
- *Ozone: What is it and why do we care about it?*
- *Polar Ice*
- *Volcanoes and Global Climate Change*

Planetary Geology Teacher Guide

Please Note: Print materials in the above packets are subject to change without notice.

Our Water Planet From Space: NASA...On The Cutting Edge Videoconference

60 minutes/1998 | 1/2" VHS | 002.2-21V | **16.00**
Level: Grades 5–12

Program 1: Oceans in Motion
This program explains how ocean circulation not only affects life in the oceans but also weather and climate around the world. It also examines how NASA and its partners use the vantage point of space to measure oceans height, winds, and temperature. Broadcast date: October 21, 1998.

Program 2: The Color of Oceans
The program looks at the ocean's many shades of blue, green, and red. This spectrum of color tells us a lot about the health of our oceans, which affects life on Earth. NASA's ocean-color observations from space provide a big picture of how healthy our oceans are and the role oceans play in global change. Broadcast date: October 22, 1998.

	Format	Item No.	Price

Hurricane Below

15 minutes/1974 | 1/2″ VHS | 002.3-01V | **15.00**
Level: Grades 7–10

Presents the plight of a commercial fishing vessel caught in the path of a killer hurricane. Dramatically depicts the birth of Hurricane Mimi off the coast of Africa and traces its growth and development as it brings destruction to the Central Atlantic States. These events are powerfully portrayed against the successful efforts of the crew of the dragger Dante to escape by navigating around the center of the storm with the aid of modern technology, ship-to-shore communications, and early-warning weather satellites monitoring the "hurricane below."

The Weather Watchers

15 minutes/1977 | 1/2″ VHS | 002.3-02V | **15.00**
Level: Grades 7–11

Dramatically explains the importance of meteorological information obtained from NASA satellites for predicting and monitoring severe storms. Presents unusual footage of the formation of a tornado and its destructive force.

Tornado Below

14 minutes/1975 | 1/2″ VHS | 002.3-03V | **15.00**
Level: Grades 7–10

Presents the story of a student pilot's narrow escape from the path of a tornado. This program details the formation of tornados, their destructive capabilities, and the important role early-warning weather satellites play in predicting severe weather.

	Format	Item No.	Price
Hubble Space Telescope Lecture 53 minutes/1988 Level: Adult	1/2" VHS	002.4-01V	**21.00**

Provides a videotape lecture on the Hubble Space Telescope that was developed for a teacher education course presented at U.S. Space Camp. The featured lecturer is Dr. Frank Six of NASA's Marshall Space Flight Center. He discusses the Space Telescope's capability for superior spectral coverage, sensitivity, resolution, and stability, while demonstrating practical ways to explain these concepts to students.

The Hubble Space Telescope 28 minutes/1989 Level: Grades 9–Adult	1/2" VHS	002.4-02V	**16.00**

Offers an imaginative and entertaining look at how the Hubble Space Telescope will examine some of the mysteries of our universe, including: stellar evolution, expansion of the universe, supernovae, and quasars. This program combines animation, NASA footage, and interviews with NASA scientists to inform the audience about potential Space Telescope discoveries. Copyrighted by BDM International, Inc.

The Cosmic Background Explorer 13 minutes/1989 Level: Grades 9–Adult	1/2" VHS	002.4-03V	**15.00**

Provides a brief overview of the mission that will launch the Cosmic Background Explorer (COBE), a unique satellite that will study cosmic background radiation. The mission's purpose to is to discover how the once-smooth universe evolved into the planets, stars, and galaxies that exist today. The COBE mission will be used to gather evidence to prove or disprove the current theory of cosmic evolution. Includes animation depicting the satellite's deployment and orbit.

NASA'S Hubble Space Telescope: The Challenge & Complexity of Operations 18 minutes/1990 Level: Grades 11–Adult	1/2" VHS	002.4-04V	**15.00**

Details how NASA uses scientists, researchers, and engineers throughout the world to meet the challenge of monitoring and maintaining the Hubble Space Telescope. Touches on procedures for sending commands to the telescope, archiving and distributing data, and scheduling observation time. Also includes a segment on some of the complex steps that were taken to deploy the telescope.

And Then There Was Voyager 30 minutes/1990 Level: Grades 11–Adult	1/2" VHS	002.4-05V	**16.00**

Uses interviews with NASA scientists and computer graphics to highlight the major discoveries the Voyager spacecraft made about Jupiter, Saturn, Uranus, Neptune, and their satellites. Chronicles the Voyager missions using actual network newscasts.

	Format	Item No.	Price
Hubble Space Telescope: Rescue in Space			
50 minutes/1994 Level: Grades 4–Adult	1/2" VHS	002.4-06V	**25.00**

Offers a journey into space on one of the most important and spectacular Space Shuttle missions ever with the astronauts on this critical mission to repair the Hubble Space Telescope. See the first dramatically improved deep space images from Hubble's newly repaired cameras. Produced by Finley-Holiday Films Corporation. Available in 1/2" VHS format only.

Hubble Video Tour of the Universe			
8 minutes/1996	1/2" VHS	002.4-07V	**10.00**

Provides a "video tour" of images and discoveries made possible by the Hubble Space Telescope. Progresses from near Earth with the first servicing mission through images of planets, the life cycle of stars, black holes, and distant galaxies. Animation and video sequences depict processes and changes occurring in the universe, such as the impact of a comet, Saturn at ring plane crossing, and the birth and death of a star. Although this video has no narration or sound, it is accompanied by a written script.

	Format	Item No.	Price

Animal Physiology in Space: Frog Embryology Experiment

11 minutes/1994	1/2″ VHS	003.1-01V	**15.00**
Level: Grades 9–12			

Provides an overview of the frog embryology experiment that flew on the STS-47 Spacelab-J mission.

Liftoff to Learning: From Undersea to Outer Space

15 minutes/1994	1/2″ VHS	003.1-02V	**15.00**
Level: Grades 5–9			

Tells the story of a life sciences experiment conducted on the first Spacelab Life Sciences mission flown on the Space Shuttle. More than 2,000 jellyfish were sent in space to learn about how living things adapt to the microgravity environment of Earth orbit. Scientists examined how microgravity affects the development of young jellyfish, especially their gravity receptors. The gravity receptors of jellyfish serve a purpose similar to the inner ear of human beings for balance and orientation.

Liftoff to Learning: Assignment Spacelab

17 minutes/1995	1/2″ VHS	003.1-03V	**15.00**
Level: Grades 5–8			

Shows how the unique microgravity environment of Earth orbit is used for scientific experiments and how the rules of scientific experimentation and safety that apply to research on Earth also apply to astronauts in space. On-orbit scenes were taken during the STS-58 mission of Columbia.

The Origin and Early Evolution of Life

21 minutes/1995	1/2″ VHS	003.1-04V	**16.00**
Level: Undergraduate & Graduate Students			

Explores Earth's early stages of existence and the theories proposed to explain the evolution of life on Earth.

SETI: The Search for Extraterrestrial Intelligence

21 minutes/1996	1/2″ VHS	003.1-05V	**16.00**
Level: Undergraduate & Graduate Students			

Examines how present-day technology is used to seek evidence of intelligent life elsewhere in the universe.

The Cardiovascular System in Space

18 minutes/1994	1/2″ VHS	003.1-06V	**16.00**
Level: Undergraduate & Graduate Students			

Provides a detailed account of the effects of gravity on the human circulatory system. Discusses how the loss of gravity-induced blood pressure gradients leads to medical problems associated with headward edema, reduced blood volume, and postflight orthostatic intolerance.

	Format	Item No.	Price

The Musculoskeletal System in Space

21 minutes/1995 1/2" VHS 003.1-07V **16.00**
Level: Undergraduate & Graduate Students

Discusses changes that occur in our musculoskeletal system in the absence of weight-bearing, as well as the countermeasures that can be developed to reduce muscle atrophy, bone loss, and back pain in space.

Group Interactions and Crew Performance

23 minutes/1996 1/2" VHS 003.1-08V **16.00**
Level: Undergraduate & Graduate Students

Elaborates on group cohesion, open communication, and overall well-being among crew members. Furthermore, shows how Earth analogs can be used as models to study the psychological effects of long-term confinement.

Life Support Systems in Space

12 minutes/1995 1/2" VHS 003.1-09V **15.00**
Level: Undergraduate & Graduate Students

Outlines the potential hazards faced by astronauts on space missions and describes the equipment required for survival in environments hostile to life.

Liftoff to Learning: Plants in Space

13 minutes/1999 1/2" VHS 003.1-10V **15.00**
Level: Grades 5–12
APPLICATION: **Life Science**

Students at an elementary school participate in an experiment on plant growth with Space Shuttle astronauts. Identical seed growth pouches are planted with corn and soybean seeds. Some of the seeds are germinated on Earth and others on the Space Shuttle in Earth orbit. Rather than drawing conclusions on the effects of microgravity on plant growth, viewers are invited to participate in the experiment by growing seeds on Earth as control experiments. Accompanied by a video resource guide which provides data on the experimental plants grown in space. This data can be compared with the data collected on the control plants.

	Format	Item No.	Price

Space for Women

27 minutes/1981 | 1/2″ VHS | 004.0-01V | **16.00**
Level: Grades 9–12

Examines nontraditional career opportunities for women at NASA. Several dynamic women speak of the challenges they have mastered and the problems they have encountered while pursuing careers in the space and science fields. Narrated by Ricardo Montalban.

Where Dreams Come True

28 minutes/1981 | 1/2″ VHS | 004.0-02V | **16.00**
Level: Grades 9–12

Outlines career opportunities available at NASA for minorities and women. This is a valuable source of information for anyone interested in knowing what it is like to work for NASA. Narrated by Ricardo Montalban.

Preparing Today for Your Tomorrow

32 minutes/1988 | 1/2″ VHS | 004.0-03V | **16.00**
Level: Grades 4–8

Covers four students who share what they learned about careers while visiting NASA's Langley Research Facility. Judith Garcia, teacher in space finalist, guides these students through the Langley Research Center to speak with employees in several areas. This tape encourages students to investigate the multitude of career opportunities available to them.

Winning: Aerospace—The Next Decade

21 minutes/1990 | 1/2″ VHS | 004.0-04V | **16.00**
Level: Grades 7–12

Winning: Aerospace—The Next Decade

21 minutes/1990 | 1/2″ VHS | 004.0-05V | **16.00**
Level: Grades 7–12 | (Spanish Version)

Introduces students to the unique career opportunities in America's aerospace industry. Accompanying teacher's guide, written in English, gives suggestions on how to incorporate the video into mathematics, science, technology, communications, and English curricula. Reproduced with permission from the Aerospace Industries Association.

Engineers: Turning Ideas Into Reality

8 minutes/1990 | 1/2″ VHS | 004.0-06V | **10.00**
Level: Grades 9–Adult

Offers a series of short commentaries by several engineers on why they chose their particular field of engineering and how they feel it impacts everyday life. Reproduced with permission from the National Engineers' Week.

Reaching for the Stars (Astronaut Training Tape)

13 minutes/1993 | 1/2″ VHS | 004.0-09V | **15.00**
Level: Grades 3–Adult

Highlights the nonstop training astronauts receive on their way to the launch pad. Surveys the many different jobs astronauts have when they are not in space, including payload planning, launch assistance, mission control, and personal appearances.

	Format	Item No.	Price

Reaching for the Stars (5-Part Videoconference Series)

150 minutes/1993 Level: Grades 6–12	1/2″ VHS	004.0-10V	**24.00**

Features five young minority and female students discussing their research and academic preparation in science, math, and engineering. Encourages middle and high school students to consider careers in these fields and to prepare themselves academically to take advantage of future workforce opportunities. Includes a teacher's guide and printed support materials. Sponsored by the Virginia Space Grant Consortium, Old Dominion University, Academic Television Services, and NASA. For national distribution only.

Journey Into Cyberspace (6-Part Video Series)

146 minutes/1997 Level: Grades 5–8	1/2″ VHS	004.0-11V	**24.00**

Is sponsored and co-produced by the Virginia Space Grant Consortium and was broadcast in October 1997. In the first videotape, Dr. Shelley Canright of the NASA Langley Research Center presents an informal review of the program materials explaining their dual focus: to stimulate career exploration and to provide science/math-related activities and concepts. The subsequent five programs transport two middle school students magically through their computer to a series of university campuses, including the University of Virginia, the College of William and Mary, Virginia Tech, Old Dominion University, and Hampton University. On their journey, the students enlist the aid of university students as they work on completing a career project for their science class. Each program focuses on university students doing real world research and covers a variety of careers in the areas of mathematics, science, and engineering. The university students also explain how their ordinary interests have led to extraordinary opportunities in high-tech research and development. Additional science and career resources are available on their web site at: *http://careerjourney.vsgc.odu.edu*

	Format	Item No.	Price

Wind Energy

Those Magnificent Wind Machines

30 minutes/1980 Level: Grades 7–10	1/2" VHS	005.2-01V	**16.00**

Traces the evolution of the NASA wind program from the first wind turbine at Sandusky, Ohio, to Block Island, Rhode Island, where NASA and the local power company demonstrated that wind turbines could provide power to an electrical system. The program concludes with a look at the largest, most powerful wind turbine ever built, located in Washington State.

	Format	Item No.	Price
Shuttle Life in the World of Weightlessness 29 minutes/1985 (open captioned) Level: Grades 4–12	1/2" VHS	006.3-01V	**16.00**
Shuttle Life in the World of Weightlessness 29 minutes/1985 Level: Grades 4–12	1/2" VHS	006.3-02V	**16.00**

Presents Dr. Sally Ride showing the problems and opportunities that orbiting the Earth aboard the Space Shuttle posed for daily living.

Eating and Sleeping in Space 30 minutes/1985 (open captioned) Level: Grades 4–12	1/2" VHS	006.3-03V	**16.00**
Eating and Sleeping in Space 30 minutes/1985 Level: Grades 4–12	1/2" VHS	006.3-04V	**16.00**

Presents Dr. Sally Ride discussing how astronauts eat and sleep aboard the Space Shuttle.

Astrosmiles 24 minutes/1986 Level: Grades 7–Adult	1/2" VHS	006.3-05V	**16.00**

Contains footage from postflight press conferences of several missions showing life aboard the Shuttle, including daily living activities and scientific experiments. This video is educational and entertaining.

Toys in Space 17 minutes/1985 Level: Grades 4–8	1/2" VHS	006.3-06V	**15.00**

Shows elementary students hypothesizing about how selected toys will perform in the weightless conditions of space. Classroom discussion is followed by footage of astronauts demonstrating these toys during a 1985 Space Shuttle flight. Four toys are highlighted: top, ball and jacks, slinky, and yo-yo.

Toys in Space: Mission 51-D Highlights 60 minutes/1985 Level: Grades 4–Adult	1/2" VHS	006.3-07V	**21.00**

Offers 10 mini-segments during which astronauts give detailed explanations of how toys operated in the microgravity environment of the Space Shuttle. Demonstrations are followed by excerpts from the STS 51-D postflight press conference.

Toys in Space Activity Kit 10-piece set		006.3-07P	**30.00**

Contains the 10 toys Shuttle astronauts carried with them on STS 51-D. Designed to be used with the "Toys in Space" videotape programs.

	Format	Item No.	Price
The NASA Space Suit			
15 minutes/1990 Level: Grades 7–Adult	1/2″ VHS	006.3-08V	**15.00**

Examines the evolution and design of the NASA spacesuit from a 1930's pressure suit used by aviator Wiley Post to the current extravehicular maneuvering unit used on the Space Shuttle.

Suited for Space Videoconference			
60 minutes/1991 Level: Grades 5–8	1/2″ VHS	006.3-09V	**24.00**

Shows an interactive Challenger Center videoconference on January 25, 1991. Features David Zahren, Challenger Center faculty member, demonstrating activities that illustrate the harshness of outer space. Astronaut Dr. Kathryn Sullivan explains the Shuttle space suit and extravehicular mobility unit. Students from around the United States called in to ask astronaut Colonel Frederick Gregory questions about living and working in space. Includes an activity book that contains directions for many of the activities demonstrated on the tape. Reproduced with permission from the Challenger Center. The tape and activity booklet may be reproduced for educational use only.

Launching the School Year With President Bush			
60 minutes/1991 Level: Grades 3–6	1/2″ VHS	006.3-10V	**21.00**

Presents President George Bush and NASA Administrator Richard Truly teaching a unique math and science lesson aimed at elementary-level students. Third and fourth graders from Washington, D.C., and La Porte, Texas, ask the President questions and learn about living and working in space. Participants include astronauts Charlie Bolden and Tammy Jernigan and Spacemobile teacher Lisa McLeod. This program was broadcast live on September 17, 1991.

Liftoff to Learning: All Systems Go			
34 minutes/1992 Level: Grades 5–12	1/2″ VHS	006.3-11V	**16.00**

Presents the astronauts on orbit during the first Spacelab Life Sciences mission discussing some of the physiological changes that occur in the human body while in a microgravity environment and attempts to answer important questions on how the body readapts to Earth's environment. The videotape shows research conducted aboard the Space Shuttle on six systems that examine the heart, lungs, blood, muscles, cells, and the immune system, among others. This program is segmented, enabling teachers to extract topics that are most relevant to current classroom studies.

Physics of Toys in Space			
51 minutes/1993 Level: Grades K–12	1/2″ VHS	006.3-12V	**21.00**

Presents the astronauts on board Space Shuttle mission STS-54 using the laws of physics to demonstrate how toys perform in microgravity. The astronauts answer questions from four elementary schools while performing experiments. The featured toys include: swimming fish, frog, and submarine; balloon helicopter; gyroscope and gravitron; friction-engine car and circular track; magnetic marbles; Rat Stuff, the flipping mouse; basketball and hoop; and paper boomerang. Includes a Video Resource Guide.

	Format	Item No.	Price

Toys in Space II Activity Kit

7-piece set 006.3-12P **25.00**

Contains seven of the toys Shuttle astronauts carried with them on mission STS-54. Designed to be used with the Physics of "Toys in Space" and "Toys In Space II" videotape programs. Contains the following toys: car and track, basketball with hoop, magnetic marbles, swimming toy, gravitron, flipping toy, and balloon helicopter.

Living and Working in Space: The Countdown Has Begun

60 minutes/1993 1/2" VHS 006.3-13V **30.00**
Level: Grades 4–Adult

Offers imaginative segments examining day-to-day activities that might occur in outer space sometime in the future. Includes dozens of interviews with today's space professionals. Includes a teacher's guide. Copyrighted by FASE Productions. Available in 1/2" VHS only.

Liftoff to Learning: Toys in Space II

37 minutes/1993 1/2" VHS 006.3-14V **16.00**
Level: Grades K–12

Provides a hands-on way for students to investigate the principles of mathematics and science that make many common toys function. The Space Shuttle crew invite students to experiment with similar toys in their classroom and hypothesize how these same toys will operate in microgravity. Scenes of the STS-54 astronauts operating the toys in space serve as data for students to confirm or reject their hypotheses. Includes a comprehensive guide.

Liftoff to Learning: Living in Space

10 minutes/1994 1/2" VHS 006.3-15V **10.00**
Level: Grades K–4

Demonstrates what it is like to live and work in space. Viewers are invited by the Space Shuttle crew to join the astronauts as they go through their daily routine living on board the Space Shuttle. Students see the similarities and differences in eating, exercising, relaxing, maintaining personal hygiene, sleeping, and working in space versus on Earth. Orbital scenes were taken during the STS-56 mission.

U.S. Microgravity Laboratory 2 Pre-flight Education Videotape

42 minutes/1995 1/2" VHS 006.3-16V **21.00**
Level: Grades K–4

Contains the ground-based experiments done by the astronaut crew aboard mission STS-73. The program is designed to show teachers and students hands-on experiments that can help them learn about microgravity research. A follow-up videotape after the September 1995 mission will show astronauts conducting many of the experiments in space. Includes Microgravity Teacher's Guide With Activities for Physical Science booklet.

Space: Home Away From Home

30 minutes/1996 1/2" VHS 006.3-17V **16.00**
Level: Grades 7–Adult

Explores the astronomical highway that is leading to living and working in space. Pioneer and former U.S. astronaut Jack Lousma tells the true and fascinating story of the Skylab adventure. Copyrighted by Glatz Film & Video, Inc. Available in 1/2" VHS only.

	Format	Item No.	Price
Mars, What Would You Wear?			
3 minutes/1998	1/2" VHS	006.3-18V	**10.00**
Level: Grades 3-12			

A humorous three-minute presentation designed to get students thinking about "What would you wear for a trip to Mars?" The program is filmed aboard NASA's KC-135 aircraft during flights to simulate different degrees of weightlessness. Hosted by Johnson Space Center engineer Phil West. Includes "Suited for Spacewalking Guide."

Space Station

A New Era of Discovery: Plans for Research on the Space Station			
60 minutes/1994	1/2" VHS	006.4-05V	**21.00**

Highlights the first live videoconference, held on February 17, 1994, by the NASA Space Station program. Provides an overview of the plans, opportunities, and benefits of space-based research. Explains how the Space Station will provide a laboratory for research in life sciences, materials, fluid physics, combustion, and biotechnology research and technology development.

International Space Station Overview			
11 minutes/1997	1/2" VHS	006.4-06V	**10.00**
Level: Grades 7–12			

Presents an overview of the International Space Station (ISS). Discusses how research conducted on board the ISS will have many benefits for humankind. Outlines the roles cooperating nations will play in the construction and maintenance of the ISS. Also discusses station design and orbit.

Go for Assembly: Building the International Space Station			
11 minutes/1997	1/2" VHS	006.4-07V	**10.00**
Level: Grades 7–12			

Chronicles the logistics of building an orbiting laboratory in space. Contains interviews with many of the astronauts who will be assembling the International Space Station. Discusses new spacesuit and tool enhancements, the robotic arm and hand, neutral buoyancy training facilities at the Johnson Space Center, and the Crew Equipment Translation Assembly Cart, which will help astronauts slide along the truss structure during station assembly.

International Space Station Teleconference: Countdown to Launch			
60 minutes/1998	1/2" VHS	006.4-08V	**16.00**
Level: Grades 6–12			

Contains an edited version of a satellite teleconference originally broadcast on February 19, 1998. During this program, space station experts demonstrate and discuss spacesuit technology, underwater and virtual training, robotic tools that will be used in construction, how and why plants are grown in space, and current research in microgravity that may lead to new medical therapies on Earth. Includes a site coordinators' guide with supporting print materials and activities.

International Space Station Teleconference: Open for Business			
120 minutes/1998	1/2" VHS	006.4-09V	**16.00**
Level: Research Specialists			

Contains an edited version of a satellite teleconference originally broadcast on February 26, 1998. This program is intended for professionals interested in space station research plans. During the teleconference, space station experts demonstrate and discuss areas of scientific and commercial research being pursued on the ISS, the potential risks and benefits for companies investing in ISS research, research opportunities and how to participate, and the scientists and entrepreneurs who are involved in space research. Includes supporting print materials.

	Format	Item No.	Price

International Space Station Video Progress Report January 1999—A New Era in Orbit

12 minutes/1999 | 1/2" VHS | 006.4-10V | **10.00**
Level: Grades 7-12

Outlines the assembly and docking sequence of the completed flights of the International Space Station through January of 1999. Also touches upon the logistics of forthcoming missions as the assembly process continues through completion.

Station Reel Time Series

3-Part Series | 1/2" VHS | 006.4-11V | **16.00**
(condensed onto 1 videocassete)
Level: Grades 3–8

This multiple-part series consists of short programs highlighting different aspects of the International Space Station. As additional programs are produced, they will automatically be added to the series.

Program 1: Crew Return Vehicle

This program takes a look at some of the key features of the International Space Station Crew Return Vehicle, the X-38. The X-38 is compared to a lifeboat in space because it will be used to carry the crew back to Earth in the event of an emergency aboard the Space Station. It highlights the parafoil parachute used for landing, the automated landing system, and the shape and size of the spacecraft. Accompanied by NASA Educational Brief EB-1998-11-127-HQ/International Space Station Crew Return Vehicle: X-38.

Program 2: Power Systems

Examines how electricity will be generated on the International Space Station. The Space Station is the largest structure ever built in space. It will be powered by eight solar panels that collect energy from the Sun through the use of photovoltaic cells. Photovoltaic cells are used on Earth too, in toys, solar calculators, at school crossings, and many other places. Once the energy is collected it will be used to charge batteries which will provide power to the Space Station when it is not in direct sunlight. Batteries are also used when more power is needed for experiments and research. The other half of the power produced will go directly to the laboratories and modules, or rooms of the Space Station. This power will also run the life support systems, which includes the air the astronauts will breath, the food systems, and the temperature controls. Accompanied by NASA Educational Topic ET-1998-07-003-HQ/From Sunlight to Power: International Space Station Solar Arrays.

International Space Station: Some Assembly Required

60 minutes/1999 | 1/2" VHS | 006.4-20V | **16.00**
Level: Grades 6–12

Students get an inside look at what it takes to assemble the people, the parts, and the plans for the world's largest orbiting research facility, the International Space Station. Today, flight hardware is being manufactured in many countries around the globe and the elements of ISS are beginning to be launched and assembled in space. In this program space station experts show: astronaut training around the world; basics of living and working in space; a look inside the ISS modules and how they work; current research in microgravity and the benefits for life on Earth. This program is a videotape of a live teleconference broadcast in February 1999.

	Format	Item No.	Price

General

NASA . . . The 25th Year

50 minutes/1983 | 1/2″ VHS | 007.0-01V | **21.00**
Level: Grades 9–Adult

Chronicles, from Explorer I to the Space Shuttle, the numerous challenges and accomplishments that have marked a quarter century of air and space exploration.

Mercury/Gemini/Apollo Overview

13 minutes/1987 | 1/2″ VHS | 007.0-02V | **15.00**
Level: Grades 7–Adult

Provides a concise summary of the Mercury, Gemini, and Apollo missions, including mission-by-mission accomplishments and historic footage of launches, on-orbit activities, and splashdowns.

History of Spaceflight

58 minutes/1992 | 1/2″ VHS | 007.0-03V | **25.00**
Level: Grades 9–Adult

Uses a combination of rare paintings, historical footage, and the latest computer animation to trace the development of spaceflight. Shows how the vision and insight of rocket pioneer Wernher von Braun laid out the first serious blueprint for space, which led to the reality of manned spaceflight and provided much of the impetus for today's space programs. Hosted by astronaut Alan Shepard. Copyrighted by Finley-Holiday Films. Available in 1/2″ VHS only.

America in Space: The First 40 Years

60 minutes/1996 | 1/2″ VHS | 007.0-04V | **25.00**

From the original Mercury flights to the International Space Station and Mars, presents the complete saga of America's first 40 years in space. Copyrighted by Finley-Holiday Films/Steve Skootsky. Public performance rights for schools and libraries. All other rights reserved. Available in 1/2″ VHS format only.

Mercury Program

Astronauts . . . U.S. Project Mercury

28 minutes/1960 | 1/2″ VHS | 007.1-01V | **16.00**
Level: Grades 7–12

Presents the story of the seven original U.S. astronauts. Explains their selection, testing, and training for America's first manned space program.

	Format	Item No.	Price

Apollo Program

The Flight of Apollo 11 (The Eagle Has Landed)

30 minutes/1969	1/2" VHS	007.3-01V	**16.00**
Level: Grades 7–12			

Presents the story of the first Moon landing in July 1969. Depicts the principal events of the mission, from the launching through the postrecovery activities of astronauts Armstrong, Aldrin, and Collins. Through television, motion pictures, and still photography, the program provides an "eyewitness" perspective of the Apollo 11 mission.

The Time of Apollo

28 minutes/1975	1/2" VHS	007.3-02V	**16.00**
Level: Grades 4–Adult			

Offers a tribute to the historical accomplishments of the Apollo missions. As President Kennedy stated in 1961: "This nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to Earth."

On the Shoulders of Giants

28 minutes/1973	1/2" VHS	007.3-03V	**16.00**
Level: Grades 7–Adult			

Tells the story of Apollo 17, the final mission to the Moon. Includes an abundance of excellent footage of astronauts Cernan and Schmitt using the lunar rover, collecting more than 250 pounds of lunar rocks, and setting up experiments on the lunar surface.

Apollo 13—Houston We've Got a Problem

28 minutes/1970	1/2" VHS	007.3-04V	**16.00**
Level: Grades 7–Adult			

Depicts the dramatic voyage of Apollo 13, in which the most serious accident ever to occur in space changed the mission from a routine lunar landing to a desperate fight for crew survival. The film ends with worldwide relief and joy when astronauts James Lovell, John Swigert, and Fred Haise splash down on target in the Pacific Ocean.

Space Shuttle Program

Shuttle: A Remarkable Flying Machine

30 minutes/1981	1/2" VHS	007.6-10V	**16.00**
Level: Grades 4–Adult			

Features the first historic flight of the Space Shuttle Columbia. Highlights include the liftoff on April 12, 1981, the onboard activities of Young and Crippen, and a spectacular landing on Rogers Dry Lake bed in California.

	Format	Item No.	Price

We Deliver: Summary of Shuttle Flights 5, 6, 7 & 8

30 minutes/1983 | 1/2″ VHS | 007.6-11V | **16.00**
Level: Grades 4–Adult

Covers the first four operational missions of the Space Transportation System, STS flights 5, 6, 7, and 8. It stresses the operational common denominator of these missions—satellite deployment—and includes significant secondary achievements, such as the first female astronaut, the first African-American astronaut, the first night launch and landing, and some of the more important onboard experiments.

Space Shuttle Demonstration

15 minutes/1983 | 1/2″ VHS | 007.6.12V | **15.00**
(signed for the hearing impaired)

Prepared by the Kennedy Space Center, explains the Space Shuttle to hearing-impaired adults.

Mission STS-26: The Crew Report

18 minutes/1988 | 1/2″ VHS | 007.6-13V | **15.00**
Level: Grades 5–Adult

Provides an overview of the September 29, 1988, mission of Discovery, the first Space Shuttle mission after the Challenger accident. Narrated by mission astronauts, this program highlights the deployment of a communications satellite and the science experiments performed on board. It contains beautiful views of the Earth and an amusing look at Shuttle life set to popular music.

Return to Space

15 minutes/1988 | 1/2″ VHS | 007.6-17V | **15.00**
Level: Grades 7–Adult

Tells the story of how STS-26 returned America to space after the Challenger disaster. The program details the improvements made to the Space Shuttle and summarizes some of the major accomplishments of past Shuttle flights.

The Space Shuttle: America's Team Reaching for the Future

24 minutes/1989 | 1/2″ VHS | 007.6-19V | **16.00**
Level: Grades 11–Adult

Outlines how the NASA centers located throughout the United States contribute to the building of the Space Shuttle. It details the specific functions performed by each NASA facility.

The Dream Is Alive

37 minutes/1985 | 1/2″ VHS | 007.6-22V | **30.00**
Level: Grades 4–Adult

Narrated by Walter Cronkite, gives you a window seat on the Shuttle. The viewer can share the astronauts' experiences of working, eating, and sleeping in zero gravity and can look back at our magnificent Earth and witness an exciting satellite repair. Copyrighted by the Smithsonian Institution/Lockheed Corporation. Available in 1/2″ VHS format only.

	Format	Item No.	Price

Liftoff! An Astronaut's Journey

50 minutes/1990 | 1/2" VHS | 007.6-23V | **16.00**
Level: Grades 7–Adult

From astronaut training through the heart-pounding moments of rescuing a 12-ton satellite from low-Earth orbit, to landing the heaviest Shuttle ever, offers the key moments of Space Shuttle mission STS-32. With exclusive interviews and NASA footage, you will discover what really goes into being one of America's astronauts. Copyrighted by Space Media Network and Cimarron Productions, Inc. Available in 1/2" VHS format only.

Spacelab Life Sciences Missions 1 & 2

8 minutes/1990 | 1/2" VHS | 007.6-24V | **10.00**
Level: Grades 9–Adult

Describes the Spacelab Life Sciences Shuttle missions dedicated to the study of immediate and long-term changes that occur in the human body during weightlessness. It outlines many of the experiments to be performed.

Liftoff to Learning: Space Basics

21 minutes/1991 | 1/2" VHS | 007.6-25V | **16.00**
Level: Grades 5–8

Shows astronauts aboard Shuttle mission STS-41 using computer graphics and visual demonstration to answer four basic questions about spaceflight: How do spacecraft travel into space? How do spacecraft remain in orbit? Why do astronauts float in space? How do spacecraft return to Earth? Viewers learn how English scientist Isaac Newton formulated the basic science behind Earth's orbit more than 300 years ago.

Liftoff to Learning: Go for EVA

14 minutes/1991 | 1/2" VHS | 007.6-26V | **15.00**
Level: Grades K–8

Presents astronauts aboard Atlantis mission STS-37 discussing the reasons for wearing spacesuits during spacewalking missions, how spacesuits work, and what kinds of jobs astronauts perform while spacewalking. Actual footage of spacewalks—also known as extravehicular activities (EVA's)—illustrate how spacesuits allow astronauts to operate scientific apparatus, assemble equipment and structures, pilot the Manned Maneuvering Unit, take pictures, and service satellites and space hardware.

Liftoff to Learning: Newton in Space

13 minutes/1992 | 1/2" VHS | 007.6-27V | **15.00**
Level: Grades 5–8

Shows astronauts on orbit during Mission STS-39 demonstrating the importance of Newton's laws of motion to spaceflight. The program explains the difference between weight and mass, the basic principles of balanced and unbalanced forces, action and opposite reactions, and how the three laws of motions affect the way a rocket operates. Using the microgravity environment of Earth's orbit, Space Shuttle astronauts conduct simple force and motion demonstrations in ways not possible on Earth.

	Format	Item No.	Price
The Space Shuttle Story			
60 minutes/1996	1/2" VHS	007.6-28V	**25.00**

Contains the ultimate collection of Space Shuttle adventures compiled from more than 40 missions spanning 8 years. Recovering from the *Challenger* accident, Shuttle astronauts launch missions to Venus and Jupiter, repair the Hubble Space Telescope, probe planet Earth, expand the frontiers of space, and visit the Russian space station *Mir*. Included are numerous clips from astronauts' "home movies," complete with crew member comments, retrieved from NASA's archives and rarely seen by the public. Available in 1/2" VHS format only.

	Format	Item No.	Price
To Dream . . . To Learn 29 minutes/1985 (open captioned) Level: Grades 4–Adult	1/2" VHS	008.0-01V	**16.00**
To Dream . . . To Learn 29 minutes/1985 Level: Grades 4–Adult	1/2" VHS	008.0-02V	**16.00**

Documents two Ohio public schools that outfitted school buses as Space Shuttles (first segment of program). The school bus "ground shuttles" were sent on "missions" during which students learned much about space travel. Shows Shuttle astronauts demonstrating toys during Space Shuttle mission 51-D (second half of program). Students were asked to speculate as to how the toys would react in the weightless environment of space. Includes a video lesson guide.

1982 Aeronautics & Space Highlights 15 minutes/1982 Level: Grades 10–Adult	1/2" VHS	008.0-04V	**15.00**

Highlights the U.S. aeronautics and space efforts of 1982, including three missions of Space Shuttle Columbia, a new Landsat satellite, and the ADI scissor wing aircraft.

Marshall Space Flight Center: The First 25 Years 29 minutes/1986 Level: Grades 9–12	1/2" VHS	008.0-05V	**16.00**

Reviews several aerospace milestones of the last quarter century and their contributions to daily life.

Science Operations in Space: Lessons Learned 32 minutes/1988 Level: Adult	1/2" VHS	008.0-06V	**16.00**

Demonstrates how experiments can be more effectively designed to operate optimally aboard the Space Shuttle. Includes remarkable footage of the Remote Manipulator System and an extravehicular activity. Conceived by a group of veteran astronauts.

Seeing Beyond the Obvious: Understanding Perceptions in Everyday & Novel Environments 46 minutes/1990 Level: Adult	1/2" VHS	008.0-07V	**21.00**

Motivates student interest in basic issues of visual perception by showing how the development of current visual display technology has effected aerospace applications. Includes an instructor's guide.

Liftoff to Learning: Voyage of Endeavour—Then & Now 20 minutes/1992 Level: Grades 5–12	1/2" VHS	008.0-08V	**16.00**

Captures the excitement of the maiden flight of NASA's Space Shuttle Endeavour and contrasts it with its namesake, the 17th century research sailing vessel commanded by James Cook. Students will experience Endeavour's historic rescue of the stranded INTELSAT VI satellite and the first three-person extravehicular activity. Cook's voyage provides an apt parallel: charting unexplored land and waters in the South Pacific, New Zealand, and Australia and using scientists and artists to collect data on plants, wildlife, and native peoples. Orbital scenes were taken during the STS-49 mission in May 1992.

	Format	Item No.	Price

Liftoff to Learning: Geography From Space

15 minutes/1997 1/2" VHS 008.0-09V **15.00**
Level: Grades K–8
Application: Earth and Space Science, Life Science in Personal and Social Perspectives

Takes the viewer on a rapid tour of Earth's surface as seen from outer space. After explaining how the altitude of the viewer affects the amount of Earth's surfaces seen at one time, the video moves into a travelogue on some of the interesting features of Earth's continents as seen from space. Because the inclination of the Space Shuttle's orbit to Earth's equator did not carry the crew over Antarctica or the Arctic, these regions are not visited in the program.

	Format	Item No.	Price
Visions of Other Worlds 29 minutes/1984 Level: Grades 10–12	1/2" VHS	009.0-01V	**16.00**

Explores the work of 27 leading science fiction/science fact artists, including former astronaut Alan Bean and the first artist to travel in space.

	Format	Item No.	Price

General

Images of Earth and Space: The Role of Visualization in NASA Science

18 minutes/1996 | 1/2″ VHS | 010.0-01V | **15.00**
Level: Grades 7–12

Demonstrates how observations and supercomputer models are used as tools in studying the Earth and space sciences. Explains how researchers turn billions of bytes of data into colorful scientific visualizations. These pictorial representations are helping NASA and the scientists the Agency supports gain unprecedented insights into natural and physical phenomena.

Images of Earth and Space II

15 minutes/1998 | 1/2" | VHS010.0-02V | **15.00**
Level: Grades 9-Undergraduate

Uses computer simulations to "tour" the Solar System and outer space. At the Sun, simulations investigate processes that create magnetic fields and release energetic particles. Earth science begins with the Pacific Ocean, studying the 1997-98 El Niño and Cyclone Susan. Crossing the globe, visualizations trace North America's East coast and ocean currents in the North Atlantic Ocean. The night light from the world's cities then shows human impact. Next, two models probe nearby space phenomena, fluid behavior in microgravity conditions, and an asteroid collision. A jaunt to Mars explores the mountains and trenches of its dry, rocky exterior. The video concludes at a binary neutron star system, where two city-sized objects with the Sun's mass merge in a titanic explosion.

Astronomy

Comet Halley Returns

29 minutes/1986 | 1/2″ VHS | 010.1-01V | **16.00**
Level: Grades 11–Adult

Details Comet Halley's 1985–1986 rendezvous with the Earth and the Sun. Dr. Robert D. Chapman is interviewed at NASA's Lewis Research Center about Comet Halley's next visit to the vicinity of the Earth and the Sun.

Partnership Into Space: Mission Helios

28 minutes/1975 | 1/2″ VHS | 010.1-02V | **16.00**
Level: Grades 7–10

Follows the development and launch of Helios, which orbited the Sun closer than any human-made object to date. With a montage of artwork depicting our fascination with the Sun, the tape discusses the present-day technological efforts to grasp the significance and influence of the Sun on our planet.

Universe

30 minutes/1976 | 1/2″ VHS | 010.1-04V | **16.00**
Level: Grades 7–11

Universe

30 minutes/1976 | 1/2″ VHS | 010.1-05V | **16.00**
(captioned at the 2nd grade level)
Level: Grades 7–11

	Format	Item No.	Price
Universe 30 minutes/1976 (captioned at the 3rd grade level) Level: Grades 7–11	1/2" VHS	010.1-06V	**16.00**
Universe 30 minutes/1976 (captioned at the 4th grade level) Level: Grades 7–11	1/2" VHS	010.1-07V	**16.00**

Let's the viewer travel billions of years through time watching the universe evolve from one primordial mass into the stars and galaxies that we see today. Shows how the tremendous forces of gravity work, creating swirling clouds of gases and cosmic matter that are eventually transformed into stars and galaxies. What mysterious forces are behind such oddities as pulsars, quasars, and black holes? What causes the solar wind? What is a supernova? The answers to these and other questions are covered in this program. Narrated by William Shatner.

A View of the Sky

30 minutes/1967 | 1/2" VHS | 010.1-08V | **16.00**
Level: Grades 11–Adult

Explores various historical theories of the origin and order of the solar system from Copernicus through Einstein with the use of symbolic photography and with a brief look at the modern scientific exploration of space.

Supernova II

10 minutes/1988 | 1/2" VHS | 010.1-09V | **10.00**
Level: Adult

Describes the recent discovery of the supernova SN 1987A on February 23, 1987. NASA scientists explain how natural nucleosynthesis (formation of heavy elements) occurs when a supernova is formed and how studying the death of stars will help explain the origin of the universe.

Space Classroom: Assignment the Stars

27 minutes/1992 | 1/2" VHS | 010.1-10V | **16.00**
Level: Grades 6–8

Details the NASA educational effort that brought the crew of the orbiting Astro-1 mission (December 1990) and groups of middle school students together for a live astronomy lesson from space. The astronauts teach students about the electromagnetic spectrum and how it relates to an astronomy mission. Includes a teacher's guide/activity book.

NASA's Hubble Space Telescope: The Best Is Yet to Come

8 minutes/1994 | 1/2" VHS | 010.1-11V | **10.00**

Encapsulates the come-from-behind human endeavor of restoring the Hubble Space Telescope to its original scientific potential. Features the most visually striking moments while interweaving stories told by the participants. This mission succeeded because of many individuals' efforts: their dedication in spite of failures, teamwork, relentless planning, and rehearsing, as well as the enthusiasm of the young scientists and engineers. The tape expresses emotions felt for the excitement of discovery and the beauty of science at the frontier of knowledge. Produced by BDM Feder, Inc. Communications Group.

	Format	Item No.	Price
Comet Chasers: On the Trail of a Comet			
77 minutes/1997 Level: Grades 9–Adult	1/2" VHS	010.1-13V	**24.00**

Presents a taping of a live conference celebrating the Comet Hale-Bopp flyby. This multicamera presentation is hosted by Leslie Loews and Catherine Collins of NASA's Jet Propulsion Laboratory. The main focus of this program is a panel discussion with astronomers Alan Hale, Thomas Bopp, David Levy, and Don Yeomans.

Stardust—Bringing Cosmic History to Earth			
08 minutes/1997	1/2" VHS	010.1-14V	**10.00**

Provides an overview of the Stardust mission that launched a spacecraft to the comet Wild 2 on February 1999 to capture particles, and return them to Earth. This three-dimensional animated video follows the Stardust mission from launch to the wondrous reentry to Earth. Copyrighted by the California Institute of Technology.
Visit the web site: *http://stardust.jpl.nasa.gov/*

The New Solar System			
60 minutes/1996	1/2" VHS	010.1-15V	**25.00**

Shows the story of our solar system as never before presented. Featuring the most complete collections of visuals ever assembled, this educational program takes you on a complete tour of the solar system, including a Jupiter-comet crash movie. Copyrighted by Finley-Holiday Films. Public performance rights for schools and libraries. All other rights reserved. Available in 1/2" VHS format only.

Small Bodies, Big Impact—Cool Comets, Awesome Asteroids: NASA... On the Cutting Edge Videoconference:			
60 minutes/1999	1/2" VHS	010.1-16V	**16.00**

Program 1: Cool Comets
"Cool Comets" looks at the dirty snowballs which turn into the beautiful celestial bodies we can see from Earth. Viewers will go behind the scenes to discover high-tech NASA missions that will capture comet dust samples and bring them back to Earth. The samples will give us new information about comets and help us understand the origins of our Solar System. This is a videotape of a live broadcast which took place on March 10, 1999.

Program 2: Awesome Asteroids
"Awesome Asteroids" looks at the rocky bodies we call asteroids, one of which may have caused the extinction of the dinosaurs. Viewers will learn about space missions to orbit and map a near-Earth asteroid for the first time, helping to reveal clues about the formation of our Solar System. This is a videotape of a live broadcast which took place on March 11, 1999.

Planetary

	Format	Item No.	Price

Our Solar System

29 minutes/1992 | 1/2" VHS | 010.2-01V | **10.00**
Level: Grades K–4

Teaches the names, orbital positions, and characteristics of each planet using the phrase "my very educated mother just served us nine pizza pies." The program is partially animated, set to music, and appropriate for early elementary grades. **Each tape contains four 5-minute versions of the program: English, Spanish, sign language, and open captioned.** Copyrighted by the Arizona Board of Regents.

Voyager, The Grand Tour

18 minutes/1990 | 1/2" VHS | 010.2-02V | **15.00**
Level: Grades 4–12

Highlights the significant features discovered by Voyagers 1 and 2 as these spacecraft traveled past the outer planets of Jupiter, Saturn, Uranus, and Neptune. A computer-animated video copyrighted by and reproduced with permission from Martin Marietta. For educational use only.

On Robot Wings: A Flight Through the Solar System

30 minutes/1992 | 1/2" VHS | 010.2-03V | **25.00**

Shows that unmanned spacecraft have extended our knowledge of the solar system in ways that could only be dreamed of a few decades ago. Featuring amazing footage from NASA's Jet Propulsion Laboratory, you will fly "on robot wings" over planets and moons as if aboard a high-speed low-flying spacecraft and explore, close-up, the features of Earth, Venus, Mars, and Uranus' moon Miranda. As a special bonus, see the first ever images of Gaspra, a 12-mile-long asteroid encountered by Galileo. Copyrighted by Finley-Holiday Films Corporation. Available in 1/2" VHS format only. For noncommercial home, school, and library viewing only. All other rights reserved.

Solar System Exploration Videotape Collection

75 minutes/1992 | 1/2" VHS | 010.2-04V | **24.00**
Level: Grades 8–12

Presents a collection of highlights from the Voyager, Magellan, Galileo, and Ulysses missions. Includes a teacher's guide. The ten video features are: Voyager: A Retrospective, And Then There Was Voyager, Miranda: The Movie, Mars: The Movie, Magellan to Venus, Magellan Venus Radar Mapping Results, Galileo: The Jovian Lab, Galileo Earth Rotation Movie, Galileo Moon Rotation Movie, and Ulysses: A Solar Odyssey.

	Format	Item No.	Price

Planet Venus

Magellan—Mapping the Planet Venus

10 minutes/1991 | 1/2″ VHS | 010.2.3-01V | **10.00**
Level: Grades 7–Adult

Uses simple terms to explain how the sophisticated radar instruments on Magellan actually map the planet Venus and how the information is sent back to Earth and processed. Also takes the viewer on a computer-simulated flight over the planet highlighting important surface features. Since August 1990, the space probe Magellan has sent back more imaging data on the planet Venus than all U.S. planetary missions combined.

Collection of Magellan Venus Radar Mapping Results

15 minutes/1992 | 1/2″ VHS | 010.2.3-02V | **15.00**

Shows that computer-animated techniques create simulated flights over the surface of Venus. Video sequences use radar-mapping data recorded by Magellan from September 1990 through February 1992.

Planet Mars

Mars, The Next Step

6 minutes/1986 (open captioned) | 1/2″ VHS | 010.2.4-01V | **10.00**
Level: Grades 4–8 (hearing impaired)

Depicts a mission to Mars involving three vehicles launched from Earth, 6 months of interplanetary travel, and the establishment of a base on the Martian soil.

19 Minutes to Earth

15 minutes/1978 | 1/2″ VHS | 010.2.4-02V | **15.00**
Level: Grades 9–12

Examines the scientific findings of the Viking missions to Mars. Viewers are introduced to a variety of information returned to Earth, including soil and atmospheric analysis and biological and geological data. Difficulties encountered in interpreting Viking's data are discussed. Actual photographs taken by the Viking 1 and 2 spacecraft are shown.

Planet Mars

30 minutes/1979 | 1/2″ VHS | 010.2.4-03V | **16.00**
Level: Grades 7–Adult

Tells the story of the exploration of our celestial neighbor, Mars, from early investigations by telescope to the landing of the Viking robot lander on the Martian surface. Mars has been given top priority in planetary explorations. During the past decade, we have sent several spacecraft to observe and photograph the Red Planet.

	Format	Item No.	Price

Mars: The Search Begins

28 minutes/1973 | 1/2" VHS | 010.2.4-04V | **16.00**
Level: Grades 9–Adult

Uses the 7,000 pictures taken by the Mariner 9 spacecraft to analyze the planet Mars. Interesting comparisons are made between Martian geological features and similar Earth features. Narrated, in part, by Carl Sagan.

Mars Rover Sample Return Mission

5 minutes/1988 | 1/2" VHS | 010.2.4-05V | **10.00**
Level: Grades 7–Adult

Depicts, in computer-animated form, one possible scenario for NASA's plan to conduct an unmanned 3-year mission to Mars in the late 1990's. The purpose of this mission is to collect soil samples and return them to Earth.

Mapping the Martian World: The Mars Observer Mission

8 minutes/1992 | 1/2" VHS | 010.2.4-06V | **10.00**
Level: Grades 7–Adult

Using computer animation and interviews with project scientists, gives an overview of the Mars Observer Mission, which began in 1992. Highlights include goals of the mission, spacecraft design, trajectory, and mission timeline.

Mars—Past, Present, Future: The Complete Story of the Red Planet

60 minutes/1996 | 1/2" VHS | 010.2.4-07V | **25.00**

Presents persuasive evidence by NASA scientists of life on Mars. Includes a spectacular and detailed view of the planet itself and explores past, present, and future missions to the planet, including Mariner, Viking, Pathfinder, and Global Surveyor. Concludes with a history of Mars observations over the centuries and the foretelling of future space travel to Mars from noted astronomers, authors, and scientists. Produced and copyrighted by the Finley-Holiday Film Corporation. Available in 1/2" VHS format only.

Mars Mission Animation Compilation

25 minutes/1996 | 1/2" VHS | 010.2.4-08V | **16.00**
Level: Grades 7–12

Offers computer-animated scenarios of the following: Surveyor, Pathfinder, Mars: The Movie, Mars Precision Landing Animation, and Mars Global Surveyor Deployment.

Destination Mars

33 minutes/1997 | 1/2" VHS | 010.2.4-09V | **16.00**
Level: Grades 7–12

Depicts the first human mission to Mars in the year 2018. The story of the journey is told by the mission astronauts as they record entries in their journals. The program presents Mars geology and the search for life on the planet. It also illustrates the technologies being developed to transport humans to Mars and support life on the planet once humans have landed.

	Format	Item No.	Price

Planet Jupiter

Project Galileo: A Jovian Odyssey

4 minutes/1987 — 1/2″ VHS — 010.2.5-02V — **10.00**
Level: Grades 10–Adult

Presents an animated explanation of Project Galileo, a planetary exploration mission to provide an indepth investigation of Jupiter and its four satellites. Project Galileo will seek important information about the origin and evolution of the solar system.

Galileo: A Jovian Laboratory

12 minutes/1989 — 1/2″ VHS — 010.2.5-03V — **15.00**
Level: Grades 10–Adult

Describes the advanced characteristics of the Galileo spacecraft, including the functions of the probe and orbiter. Explains how studying Jupiter may provide information about the origin of the universe. Includes animation sequences illustrating Galileo's trajectory, the Io encounter, and the probe entering Jupiter's atmosphere.

Ulysses Encounter With Jupiter

5 minutes/1992 — 1/2″ VHS — 010.2.5-04V — **10.00**
Level: Grades 10–Adult

Offers a computer-animated scenario of Ulysses' 10-day tour of Jupiter on its way to the Sun. Briefly explains Jupiter's magnetosphere, plasma ring, and the trajectory Ulysses will take on its journey.

Planet Saturn

Voyager 2/Saturn Encounter

30 minutes/1981 — 1/2″ VHS — 010.2.6-01V — **16.00**
Level: Grades 7–Adult

Describes highlights of live television coverage of the Voyager 2 spacecraft's close encounter with Saturn. New discoveries about Saturn and its moons as well as other historical information and new analysis are presented. From the Jet Propulsion Laboratory in Pasadena, California, many representatives of the world's scientific press corps were present as new information about the solar system's second largest planet streamed in.

Planet Uranus

Uranus: I Will See Such Things

29 minutes/1986 — 1/2″ VHS — 010.2.7-03V — **16.00**
Level: Grades 9–Adult

Begins with the history of William Herschel's discovery of Uranus in 1781. Project scientists discuss recent discoveries made about Uranus using pictures taken during the Voyager 2 flyby in 1986. Includes a comprehensive discussion of the planet's atmosphere, moons, and rings.

Voyager Uranus Encounter Parts I & II

60 minutes/1986 — 1/2″ VHS — 010.2.7-04V — **21.00**
Level: Grades 11–Adult

Describes the Voyager flyby of Uranus and its moons, with two episodes condensed onto one tape.

	Format	Item No.	Price

Sun

Ulysses: A Voyage To The Sun

10 minutes/1985 | 1/2" VHS | 010.2.8-01V | **15.00**
Level: Grades 9–Adult

Describes the mission, planned jointly by NASA and the European Space Agency, to explore the atmosphere around the Sun. Using information obtained from Skylab, the program discusses the Sun's corona and electromagnetic field, as well as solar wind and solar flares.

Earth-Sun Relationship

6 minutes/1974 | 1/2" VHS | 010.2.8-02V | **10.00**
Level: Grades 7–Adult

Depicts in animation how the Sun and planets were formed. Explains how NASA's space probes discovered the Van Allen belt and provided information about solar wind and the magnetosphere. Also illustrates the death of a star.

Ulysses: An Expedition Over the Sun's Poles

10 minutes/1995 | 1/2" VHS | 010.2.8-03V | **10.00**
Level: Grades 9–Adult

Describes the Ulysses spacecraft, which was launched in 1990 and made some fascinating discoveries as it flew over the Sun's poles. The main objective of this mission was to compare the particles and fields above the Sun's poles with those found near its equator. This program discusses new information learned about solar wind, cosmic rays, and the magnetic field. Includes an educator guide.

ACE: Advanced Composition Explorer–Exploring Origins of the Solar System

15 minutes/1997 | 1/2" VHS | 010.2.8-04V | 10.00
Level: Grades 5–12

In an effort to understand the formation of the Solar System and how it continues to operate, NASA launched the Advanced Composition Explorer (ACE) in 1997 to observe solar particles and intergalactic material. This prelaunch program includes a brief explanation of the science ACE is studying, including: cosmic rays, solar wind, solar activity and aurorae, and the solar magnetosphere. It also discusses ACE's design and orbit. Produced and copyrighted by Johns Hopkins University Applied Physics Laboratory, all rights reserved.

Moon and Lunar Exploration

Reading the Moon's Secrets

16 minutes/1976 | 1/2" VHS | 010.3-01V | **15.00**
Level: Grades 7–12

Addresses in 10 short segments an important aspect of lunar knowledge. Designed to be used as a teaching aid in science classrooms for grades 7 and above, questions are presented in each segment.

	Format	Item No.	Price
Return to the Moon Videoconference			
60 minutes/1990 Level: Grades 5–8	1/2" VHS	010.3-02V	**24.00**

Offers a taping of an interactive teleconference on January 26, 1990. Students joined Apollo astronaut Michael Collins and NASA guest educator Dr. Lynn Bondurant on a "return to the Moon," participating in a series of unique problem-solving and hands-on activities. The program, created by the Challenger Center for Space Science Education, teaches students important concepts about the lunar voyages focusing on the journey (physics of spaceflight), exploration (lunar geology), and telecommunications and increases students' appreciation of the importance of teamwork. Students question astronaut Collins on such topics as lunar erosion, life on the Moon, and how best to prepare for space travel. Contains exciting footage of the Apollo 11 mission. Reproduced with permission from the Challenger Center. The tape and activity booklet may be reproduced for educational use only.

CRATERS! A Multi-Science Approach to Cratering and Impacts

Book and CD–ROM/1995 Level: Grades 9–12		010.3-03P	**24.95**

Includes 20 ready-to-use, hands-on activities that use cratering to teach key concepts in physics, astronomy, biology and Earth science. Includes a custom Mac/Windows CD–ROM packed with supplemental images for classroom activities. Copyrighted by the National Science Teachers Association.

Extraterrestrial Intelligence

The Quest for Contact: NASA's Search for Extraterrestrial Intelligence

35 minutes/1988 Level: Adult	1/2" VHS	010.4-01V	**16.00**

Reviews NASA's plans to carry out the most sensitive, systematic search ever conducted for extraterrestrial civilizations. Explains a high spectral resolution search that will listen for faint signals originating near solar-type stars within 100 light-years distance from the Earth, searching the entire sky for strong signals from possible civilizations anywhere in the universe. This program features the NASA SETI program's project managers and scientists, as well as SETI pioneers Frank Drake, Phillip Morrison, and Carl Sagan. Copyrighted by and reproduced with permission from the SETI Institute, a nonprofit scientific and educational organization. Not for commercial use or international distribution.

Quest for Life, Who's Out There?

29 minutes/1975 Level: Grades 10–12	1/2" VHS	010.4-02V	**16.00**

Features Orson Welles as the host of this extraordinary half-hour program. A number of distinguished scientists conclude that there is someone in outer space. From the monstrous Mars life forms of his famous 1938 radio broadcast, "The War of the Worlds," Orson Welles takes us through science fiction to science fact, to the new view of extraterrestrial life now emerging from probes to the planets and to the interstellar discoveries about the nature of life itself. This program is a fascinating portrayal of a contemporary scientific speculation that intelligent civilizations exist in the universe.

	Format	Item No.	Price

The Serendipity Machines

30 minutes/1987 | 1/2" VHS | 011.0-01V | **16.00**
Level: Grades 12–Adult

Highlights some of the many innovative spinoffs invented by NASA, including a redesigned cable gripping device and more modern braking mechanism for the San Francisco cable cars, the development of a new firefighting suit, and a portable medical treatment system.

The House That NASA Built

15 minutes/1978 | 1/2" VHS | 011.0-02V | **15.00**
Level: Grades 7–12

Covers a unique lived-in house built at the NASA Langley Research Center in Virginia to demonstrate some of the new technologies available to home builders and home owners to enhance water conservation, safety, and security.

Optics—Making Light Work

20 minutes/1993 | 1/2" VHS | 011.0-03V | **21.00**
Level: Grades 4–9

Demonstrates that the basic science concepts taught in the classroom have applications in the very specialized work done by NASA. Includes a teacher's guide with hands-on math and science activities.

Liftoff to Learning: Let's Talk Robotics

14 minutes/1998 | 1/2" VHS | 011.0-04V | **10.00**
Level: Grades 5–12
Application: Physical Science, Technology

Offers an introduction to the use of robots in space exploration. Astronauts demonstrate robotic arms and free-flying cameras on the Space Shuttle. Viewers also get to see some of NASA's robotics laboratories. The Mars Sojourner robot is featured, along with middle and high school students using robots.

Internet

Global Quest: The Internet in the Classroom

15 minutes/1993 | 1/2" VHS | 011.1-01V | **15.00**
Level: Grades 4–Adult

Describes how schools will benefit by using the Internet. This video may be freely copied and distributed for educational uses. Produced by the Imaging Technology Branch of NASA Ames Research Center.

Connecting to the Future Today

22 minutes/1994 | 1/2" VHS | 011.1-02V | **21.00**
Level: Adult

Discusses planning strategies for incorporating the Internet into your school or organization. Includes A Guide For Building a Network Infrastructure for Education.

	Format	Item No.	Price
Global Quest II: Teaching With the Internet			
22 minutes/1996 Level: Teachers	1/2" VHS	011.1-03V	**15.00**

Presents teachers who tell how finding appropriate Internet resources and integrating them into their curricula has strengthened their classroom activities and how the Internet itself has become a tremendous resource. For more information on this and other NASA Internet projects, visit them on the World Wide Web at http://quest.arc.nasa.gov.

NASA Educator Kit for the Internet			
59 minutes/1997 Level: Teachers	1/2" VHS	011.1-04V	**5.00**

Contains a videotape with the three Internet titles listed above, a CD–ROM, and written materials about NASA and the Internet. Produced to show schools how they can get connected to the Internet and what to do with it once service is established. The kit helps guide classroom teachers new to the Internet. The CD–ROM, "Exploring the Internet with NASA," was produced for young students and first-time adult users to the Internet. You will discover what the Internet is and what it is used for and gain hands-on experience navigating the Internet and the World Wide Web. For more information about NASA's Learning Technologies Project, see the program's World Wide Web site at *http://iita.ivv.nasa.gov*. Only available while supplies last.

	Format	Item No.	Price

Project Mathematics! The Theorem of Pythagoras

20 minutes/1988 1/2″ VHS 012.0-01V **16.00**
Level: Grades 9–12

Explains the Pythagorean Theorem using computer animation. Shows real-life problems that can be solved using the Pythagorean Theorem, illustrates several different animated proofs, and weaves a historical perspective. Copyrighted by and reproduced with permission from the California Institute of Technology. For educational use only. Not for international distribution.

The Theorem of Pythagoras

30 pages 012.0-01P **4.50**
Program Guide and Workbook

Begins with a brief outline of the contents of the videotape, followed by suggestions of activities that can be done prior to showing the tape. The guide is divided into sections corresponding to capsule subdivisions in the tape. Each section summarizes important points and contains exercises that can be used to strengthen understanding. Photocopies of this workbook may be made for educational use.

Project Mathematics! The Story of Pi

25 minutes/1990 1/2″ VHS 012.0-02V **16.00**
Level: Grades 9–12

Explains the story of pi with computer animation. The tape weaves a historical perspective, showing how the number pi (the ratio of the circumference to the diameter of any circle) appears in formulas for round objects and in contexts that seem to have no relation to geometry. Copyrighted by and reproduced with permission from the California Institute of Technology. For educational use only. Not for international distribution.

The Story of Pi

30 pages 012.0-02P **4.50**
Program Guide and Workbook

Begins with a brief outline of the contents of the videotape, followed by suggestions of activities that can be done prior to showing the tape. The guide is divided into sections corresponding to capsule subdivisions in the tape. Each section summarizes important points and contains exercises that can be used to strengthen understanding. Photocopies of this workbook may be made for educational use.

Project Mathematics! Similarity

25 minutes/1990 1/2″ VHS 012.0-03V **16.00**
Level: Grades 9–12

Explains similarity with computer animation. Shows examples of similar objects from real life. Introduces scaling, the basis of all measurement, and shows its use in geometry, science, and technology. Copyrighted by and reproduced with permission from the California Institute of Technology. For educational use only. Not for international distribution.

Similarity

30 pages 012.0-03P **4.50**
Program Guide and Workbook

Begins with a brief outline of the contents of the videotape, followed by suggestions of activities that can be done prior to showing the tape. The guide is divided into sections corresponding to capsule subdivisions in the tape. Each section summarizes important points and contains exercises that can be used to strengthen understanding. Photocopies of this workbook may be made for educational use.

	Format	Item No.	Price
Project Mathematics! Polynomials			
25 minutes/1991 Level: Grades 9–12	1/2″ VHS	012.0-04V	**16.00**

Opens by showing examples of polynomial curves that appear in real life, followed by a systematic description of polynomials by degree. Uses computer animation to discuss linear, quadratic, and cubic polynomials and addresses the intersections of lines and parabolas. Copyrighted by and reproduced with permission from the California Institute of Technology. For educational use only. Not for international distribution.

Polynomials			
30 pages Program Guide and Workbook		012.0-04P	**4.50**

Begins with a brief outline of the contents of the videotape, followed by suggestions of activities that can be done prior to showing the tape. The guide is divided into sections corresponding to capsule subdivisions in the tape. Each section summarizes important points and contains exercises that can be used to strengthen understanding. Photocopies of this workbook may be made for educational use.

Project Mathematics! Sines and Cosines, Part I			
28 minutes/1992 Level: Grades 9–12	1/2″ VHS	012.0-05V	**16.00**

Introduces the topic of trigonometry. The sine and cosine are first derived from the unit circle, and then their basic properties and identities are explored. The use of sine and cosine in the description of harmonic motion is illustrated visually and audibly with an electronic synthesizer and with musical instruments. The periodic nature of the sine wave is discussed, and the traditional triangular derivation of the sine and cosine is presented. Copyrighted by and reproduced with permission from the California Institute of Technology. For educational use only. Not for international distribution.

Sines and Cosines, Part I			
30 pages Program Guide and Workbook		012.0-05P	**4.50**

Begins with a brief outline of the contents of the videotape, followed by suggestions of activities that can be done prior to showing the tape. The guide is divided into sections corresponding to capsule subdivisions in the tape. Each section summarizes important points and contains exercises that can be used to strengthen understanding. Photocopies of this workbook may be made for educational use.

Project Mathematics! Sines and Cosines, Part II			
30 minutes/1993 Level: Grades 9–12	1/2″ VHS	012.0-06V	**16.00**

Focuses on the use of sines and cosines in trigonometry, with special emphasis on the law of cosines and the law of sines. They enable us to find all parts of a triangle if three parts are known and at least one of them is a side. Applications are described in astronomy, navigation, and surveying by triangulation. One of the major triumphs of surveying by triangulation is the survey of India, which took more than a century to complete. The program describes how the survey was done and how the height of Mt. Everest was determined. The program also outlines a brief history of surveying instruments, from the dioptra of ancient times to orbiting satellites of modern times. Copyrighted by and reproduced with permission from the California Institute of Technology. For educational use only. Not for international distribution.

	Format	Item No.	Price

Sines and Cosines, Part II

30 pages 012.0-06P **4.50**
Program Guide and Workbook

Begins with a brief outline of the contents of the videotape, followed by suggestions of activities that can be done prior to showing the tape. The guide is divided into sections corresponding to capsule subdivisions in the tape. Each section summarizes important points and contains exercises that can be used to strengthen understanding. Photocopies of this workbook may be made for educational use.

Project Mathematics! Sines and Cosines, Part III

30 minutes/1994 1/2" VHS 012.0-07V **16.00**
Level: Grades 9–12
Copyrighted by C.I.T.

Relates the sine and cosine of an angle with the lengths of chords on a circle. This leads to a derivation of addition formulas for determining the sine and cosine of a sum of two angles. One application shows that a combination of a sine wave and a cosine wave of the same frequency is another sine wave, possibly shifted. Another application shows how the addition formulas make it possible to determine exact expressions for sines and cosines of many angles in terms of square roots of integers. Copyrighted by and reproduced with permission from the California Institute of Technology. For educational use only. Not for international distribution.

Sines and Cosines, Part III

30 pages 012.0-07P **4.50**
Program Guide and Workbook

Begins with a brief outline of the contents of the videotape, followed by suggestions of activities that can be done prior to showing the tape. The guide is divided into sections corresponding to capsule subdivisions in the tape. Each section summarizes important points and contains exercises that can be used to strengthen understanding. Photocopies of this workbook may be made for educational use.

Project Mathematics! The Tunnel of Samos

30 minutes/1995 1/2" VHS 012.0-08V **16.00**
Level: Grades 9–12

Tells the story of a Greek engineer, Eupalinos of Megara. In the 6th century B.C., Eupalinos excavated a thousand meter tunnel straight through the heart of a mountain located on the Island of Samos in the Aegean Sea. This program describes the method used, as well as alternate methods proposed by scholars in modern times. The program also shows that the problem of delivering fresh water to large populations has been an ongoing human endeavor since ancient times. Copyrighted by and reproduced with permission from the California Institute of Technology. For educational use only. Not for international distribution.

The Tunnel of Samos

30 pages 012.0-08P **4.50**
Program Guide and Workbook

Begins with a brief outline of the contents of the videotape, followed by suggestions of activities that can be done prior to showing the tape. The guide is divided into sections corresponding to capsule subdivisions in the tape. Each section summarizes important points and contains exercises that can be used to strengthen understanding. Photocopies of this workbook may be made for educational use.

	Format	Item No.	Price

Space Flight: The Application of Orbital Mechanics

35 minutes/1989 | 1/2″ VHS | 012.0-20V | **16.00**
Level: Adult

Explains in detail planetary motion and orbital mechanics. Following a brief look at early theories on planetary orbits, animation is used to illustrate various mathematical equations and theories, including Kepler's Laws of Planetary Motion and Newton's Laws of Motion. Explains many terms associated with orbits, including perigee, apogee, eccentricity, orbital inclination, launch window, and so on. Also includes animation of a full Earth rotating, planets in orbit around the Sun, satellites in orbit, and the Hubble Space Telescope. Animation is interspersed with footage from Shuttle missions, including launches, landings, Earth views, satellite deploys, and EVA's.

Liftoff to Learning: Tethered Satellite: A Videotape for Physics and Physical Science

Part 1: 22 minutes/1995; Part 2: 19 minutes/1997 | 1/2″ VHS | 012.0-21V | **16.00**
Level: Grades 9–12

Part 1: Tethered Satellite Forces and Motion

Describes the tethered satellite concept and shows how the satellite is deployed and extended in space. The mathematics describing the forces acting on the tethered satellite/Space Shuttle orbiter system is presented.

Part 2: Electrical Circuits in Space: The Electrodynamics of the Tethered Satellite

Demonstrates how the tethered satellite and the Space Shuttle orbiter interact with Earth's magnetic field to produce an electric current. Future applications of the tethered satellite/Space Shuttle orbiter system as a motor are described

Liftoff to Learning: Microgravity

24 minutes/1996 | 1/2″ VHS | 012.0-22V | **16.00**
Level: Grades 5–12

Focuses on four scientific disciplines in microgravity studies: fluid physics, materials science, biotechnology, and combustion. Experiments within these disciplines explore how the effects of buoyancy-driven convection and sedimentation, seen in ground-based laboratories, are diminished in space, allowing scientists to expand their knowledge in these areas. "Microgravity" describes the restrictions that gravity imposes on scientific experimentation and how they can be greatly reduced in the exciting research environment of the Space Shuttle and later on in the International Space Station.

Liftoff to Learning: Mathematics of Space—Rendezvous

17 minutes/1998 | 1/2″ VHS | 012.0-23V | **15.00**
Level: Grades 5–12
Application: Mathematics

Addresses the basic mathematical operations of spacecraft rendezvous in Earth orbit. Middle school mathematics students solve problems that may occur when the Space Shuttle docks with the Russian space station *Mir*. The video has stopping points to permit viewers to work the problems. Mission STS-84 is covered, with Commander Charles Precourt, Pilot Eileen Collins, Jean-Francois Clervoy, Edward Lu, Carlos Noriega, Elena Kondakova, Jerry Linenger, and Michael Foale. Includes a video resource guide.

	Format	Item No.	Price
The Microgravity Demonstrator 21 minutes/1998 Level: Grades 5–12	1/2" VHS	012.0-24V	**15.00**

Presents the Microgravity Demonstrator, a tool to create microgravity conditions in your classroom. A series of demonstrations is used to provide a dramatically visual, physical connection between free-fall and microgravity conditions and to understand why various types of experiments are performed under microgravity conditions.

Flight Testing Newton's Laws 150 minutes/1999 Level: Grades 9–12	1/2" VHS	012.0-25V	**24.00**

Flight Testing Newton's Laws uses aircraft to stimulate students' interest in the physical sciences and mathematics during the course of 10 lessons. The main emphasis lies in showing how Newton's three laws of motion apply to flight testing an aircraft. Complementary areas of trigonometry, vector addition, weight and balance, along with resolution of forces are also employed. Includes an Educator's Guide that is presented in the format of a Flight Instructor's Manual to help guide teacher and student through each lesson. Guide is also available on-line at http://trc.dfrc.nasa.gov/trc/ntps

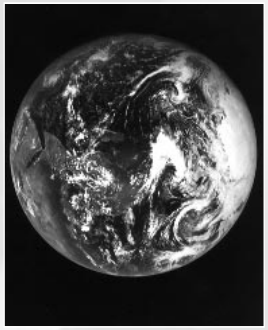
Captioned Titles for the Hearing Impaired

For your ordering convenience, the captioned videocassettes available for the hearing-impaired viewer are summarized below:

	Format	Item No.	Price
Eating and Sleeping in Space 30 minutes (open captioned)	1/2″ VHS	006.3-03V	**16.00**
Flying Machines 28 minutes (open captioned)	1/2″ VHS	001.0-04V	**16.00**
Mars, The Next Step 6 minutes (open captioned)	1/2″ VHS	010.2.4-01V	**10.00**
Our Solar System 29 minutes (open captioned)	1/2″ VHS	010.2-01V	**16.00**
Portrait of Earth: The Story of Satellites 30 minutes (captioned at the 2nd grade level)	1/2″ VHS	002.2-09V	**16.00**
Portrait of Earth: The Story of Satellites 30 minutes (captioned at the 3rd grade level)	1/2″ VHS	002.2-10V	**16.00**
Portrait of Earth: The Story of Satellites 30 minutes (captioned at the 4th grade level)	1/2″ VHS	002.2-11V	**16.00**
Shuttle Life in the World of Weightlessness 29 minutes (open captioned)	1/2″ VHS	006.3-01V	**16.00**
Space Shuttle Demonstration 15 minutes (signed for hearing impaired)	1/2″ VHS	007.6-12V	**15.00**
To Dream . . . To Learn 29 minutes (open captioned)	1/2″ VHS	008.0-01V	**16.00**
Universe 30 minutes (captioned at the 2nd grade level)	1/2″ VHS	010.1-05V	**16.00**
Universe 30 minutes (captioned at the 3rd grade level)	1/2″ VHS	010.1-06V	**16.00**
Universe 30 minutes (captioned at the 4th grade level)	1/2″ VHS	010.1-07V	**16.00**

Videocassettes—Series





	Format	Item No.	Price
History of Space Travel			
14-part series condensed onto 4 videocassettes 7 hours with printed lesson guide	1/2" VHS	099.01 V	**60.00**

Individual Episodes

Episode 1: Space Shuttle: Overview

30 minutes/1980 Level: Grades 7–12	1/2" VHS	099.01-01V	**16.00**

Reports on the preparations for an early 1981 Space Shuttle launch. The program covers the mission, the flight crew training, rocket engine tests, problems involving the thermal protection system tiles, and efforts of the NASA industry team during the final launch stages.

Episode 2: Before Saturn & America in Space

30 minutes/1980 Level: Grades 7–12	1/2" VHS	099.01-02V	**16.00**

"Before Saturn": Provides a retrospective look at the development of rockets from the early Chinese efforts through the development of the Saturn I booster. "America in Space": Recounts the achievements in unmanned and manned space projects during the first 5 years of NASA's existence.

Episode 3: Astronauts . . . U.S. Project Mercury

30 minutes/1960 Level: Grades 7–12	1/2" VHS	099.01-03V	**16.00**

Reports on the original Mercury astronauts, explaining their selection, testing, and training for America's first manned space program.

Episode 4: Freedom 7

30 minutes/1961 Level: Grades 7–12	1/2" VHS	099.01-04V	**16.00**

Documents the first American manned space mission. Covers the training, preparation, launching, and recovery of astronaut Alan B. Shepard, Jr., for the first Project Mercury suborbital flight.

Episode 5: Friendship 7, Part I

30 minutes/1962 Level: Grades 7–12	1/2" VHS	099.01-05V	**16.00**

Illustrates in detail the first American orbital spaceflight by astronaut John H. Glenn in 1962. The program also provides background on Project Mercury and the tracking network planned for the one-person Mercury missions.

	Format	Item No.	Price
Episode 6: Friendship 7, Part II			
30 minutes/1980 Level: Grades 7–12	1/2″ VHS	099.01-06V	**16.00**

Continues the historical documentary illustrating the first American orbital spaceflight by astronaut John H. Glenn in 1962 and provides background on Project Mercury and the tracking network planned for the Mercury missions.

Episode 7: Your Share in Space

30 minutes/1980 Level: Grades 7–12	1/2″ VHS	099.01-07V	**16.00**

Relates space science discoveries and their application in the daily lives of citizens. Describes booster evolution, payload development, instrumentation systems, TIROS, solar cells, data processing machines, Project Mercury, tracking and communication, X-15, Ranger, Surveyor, and Apollo. Industry participation in space research and development is also depicted.

Episode 8: Legacy of Gemini

30 minutes/1967 Level: Grades 7–12	1/2″ VHS	099.01-08V	**16.00**

Illustrates, in the perspective of a single composite mission, the major accomplishments of the Gemini two-person spaceflights and the significance of these flights to the Apollo program. The film includes outstanding photography of the Earth and humans in space.

Episode 9: Debriefing—Apollo 8

30 minutes/1969 Level: Grades 7–12	1/2″ VHS	099.01-09V	**16.00**

Tells the story of humankind's first orbit around the Moon, with commentary on the significance of the Apollo 8 flight by several prominent Americans. The program features photography of the lunar surface, the Earth as seen from the Moon, and the onboard activities of astronauts Borman, Lovell, and Anders.

Episode 10: The Flight of Apollo 11 (The Eagle Has Landed)

30 minutes/1969 Level: Grades 7–12	1/2″ VHS	099.01-10V	**16.00**

Tells the story of our first lunar landing in July 1969. Depicts the principal events of the mission, from launch through the postrecovery activities of astronauts Armstrong, Aldrin, and Collins. Through television, motion pictures, and still photography, the film provides an "eyewitness" perspective of the Apollo 11 mission.

Episode 11: Apollo 16, Nothing So Hidden

30 minutes/1972 Level: Grades 7–12	1/2″ VHS	099.01-11V	**16.00**

Provides a visual documentary account of the Apollo 16 lunar landing mission and exploration in the highland region of the Moon, near the crater Descartes. Through the use of cinema verite' techniques, the real-time anxieties and lighter moments of the support teams in Mission Control and the Science Support Room were captured. The film includes some of the most spectacular lunar photography of any Apollo mission.

	Format	Item No.	Price

Episode 12: Four Rooms Earthview

30 minutes/1975 Level: Grades 7–12	1/2" VHS	099.01-12V	**16.00**

Tells the story of the three Skylab missions, the nine astronauts, and their 171 days in the manned laboratory. Skylab was the first U.S. manned space station. Criss-crossing 70 percent of Earth's land area, Skylab sensors gathered information about many features of the planet.

Episode 13: The Mission of Apollo/Soyuz

30 minutes/1975 Level: Gade 7–12	1/2' VHS	099.01-13V	**16.00**

Stresses the spirit of cooperation and friendship, which helped make the Apollo-Soyuz mission a success. The mission was a precedent-setting event in the sphere of international manned spaceflight. The program generally follows the mission timeline, with appropriate flashbacks to detail the periods of development and training. The program concludes with a projection on the future of international cooperation in space featuring the Space Shuttle and the European development called Spacelab.

Episode 14: Teacher Silent Video Lesson Guide

30 minutes/1980 Level: Adult	1/2" VHS	099.01-14V	**16.00**

Consists of questions, definitions, and student activities that teachers can use to plan lessons around the "History of Space Travel" series.

	Format	Item No.	Price
Journey Through the Solar System			
14-part series condensed onto 4 videocassettes 7 hours with printed lesson guide	1/2″ VHS	099.02 V	**60.00**

Individual Episodes

Episode 1: Our Star the Sun

30 minutes/1982 Level: Grades 7–Adult	1/2″ VHS	099.02-01V	**16.00**

Examines pictures and observations from three Skylab missions of the 1970's. An analysis of the atmosphere, temperature, density, chemical composition, physics, and magnetic fields of the Sun is presented.

Episode 2: Mercury, Exploration of a Planet

30 minutes/1976 Level: Grades 7–Adult	1/2″ VHS	099.02-02V	**16.00**

Provides excerpts from the NASA film Mercury, Exploration of a Planet, which uses animation and photography to depict the flight of the Mariner spacecraft to Venus and Mercury. Includes a NASA program Our Solar System, suitable for primary grades.

Episode 3: Venus Pioneer

30 minutes/1982 Level: Grades 7–Adult	1/2″ VHS	099.02-03V	**16.00**

Documents the early Pioneer missions to Venus in the late 1970's through a series of animation, NASA photographs, and interviews with project scientists. Highlights some early discoveries about the planet's atmosphere and surface features.

Episode 4: Earth, The Planet

30 minutes/1982 Level: Grades 7–Adult	1/2″ VHS	099.02-04V	**16.00**

Examines Earth from the vantage point of space, describing its atmosphere and magnetic fields and presenting a view of the world through the eyes of the Landsat observation satellite.

Episode 5: Assignment . . . Shoot for the Moon

30 minutes/1982 Level: Grades 7–Adult	1/2″ VHS	099.02-05V	**16.00**

Illustrates how the Moon was surveyed by machines prior to our first lunar landing.

Episode 6: The Moon and Man

30 minutes/1982 Level: Grades 7–Adult	1/2″ VHS	099.02-06V	**16.00**

Provides segments from a compilation of historic NASA films that document many of the manned expeditions to the Moon.

	Format	Item No.	Price
Episode 7: The Fourth Planet			
30 minutes/1982 Level: Grades 7–Adult	1/2" VHS	099.02-07V	**16.00**

Shows how information gleaned from space missions began to separate fact from fiction concerning Mars, which has been the setting for many tales of science fiction.

Episode 8: Life on Mars?			
30 minutes/1982 Level: Grades 7–Adult	1/2" VHS	099.02-08V	**16.00**

Describes the experiments conducted on the Martian surface in search for life.

Episode 9: Jupiter Odyssey			
30 minutes/1974 Level: Grades 7–Adult	1/2" VHS	099.02-09V	**16.00**

Summarizes the Pioneer 10 results and highlights pictures of the largest planet in the solar system.

Episode 10: Jupiter—A Clearer Picture			
30 minutes/1982 Level: Grades 7–Adult	1/2" VHS	099.02-10V	**16.00**

Reveals fascinating findings about the moons of Jupiter as a result of data collected by the Voyager spacecraft.

Episode 11: Pioneer—Saturn Encounter			
30 minutes/1982 Level: Grades 7–Adult	1/2" VHS	099.02-11V	**16.00**

Offers views of Jupiter and Saturn from the Pioneer spacecraft.

Episode 12: Voyager 2/Saturn Encounter			
30 minutes/1982 Level: Grades 7–Adult	1/2" VHS	099.02-12V	**16.00**

Highlights live television coverage from the Voyager 2 spacecraft's close encounter with Saturn. New discoveries about Saturn and its moons as well as other historical information and new analysis are presented. From the Jet Propulsion Laboratory, many representatives of the world's scientific press corps discuss new information about the solar system's second largest planet.

Episode 13: Uranus, Neptune, Pluto and Beyond			
30 minutes/1982 Level: Grades 7–Adult	1/2" VHS	099.02-13V	**16.00**

Presents theories about the structure and nature of the three outer planets, comets, and asteroids. Spacecraft messages to "anybody out there" are reviewed.

	Format	Item No.	Price
Episode 14: Teacher Silent Video Lesson Guide			
30 minutes/1982 Level: Adult	1/2" VHS	099.02-14V	**16.00**

Consists of questions, definitions, and student activities that teachers can use to plan lessons around the "Journey Through the Solar System" series.

	Format	Item No.	Price
Life in the Universe			
14-part series condensed onto 4 videocassettes 7 hours with printed lesson guide	1/2" VHS	099.03 V	**60.00**

Individual Episodes

Episode 1: The Ingredients of Space Travel

30 minutes/1982 | 1/2" VHS | 099.03-01V | **16.00**
Level: Grades 11–Adult

Stresses the need for regenerative systems for space travel. Regenerative systems for water and oxygen are explained in detail. Astronauts are shown in a free space simulator device. An oxygen recovery and thermal control system is also examined.

Episode 2: Between the Atom and the Star

30 minutes/1982 | 1/2" VHS | 099.03-02V | **16.00**
Level: Grades 11–Adult

Investigates gravity and its effects on humans. Biologists explain the kinds of experiments that were to be done on the Earth-orbiting biosatellite. The program shows how the experiments were completed and how the information gained is important to the manned space program and further experimentation in weightlessness.

Episode 3: Zero-G and Space Suits

30 minutes/1982 | 1/2" VHS | 099.03-03V | **16.00**
Level: Grades 4–Adult

Describes the space suit worn by Apollo astronauts. The three major parts of the suit are described. Weightlessness is also examined and explained with animation, and Newton's three laws of motion are presented. Astronauts are shown in zero-gravity and in an extravehicular activity (EVA).

Episode 4: Project Mercury: An Early Step

30 minutes/1982 | 1/2" VHS | 099.03-04V | **16.00**
Level: Grades 4–Adult

Summarizes the Project Mercury flights of the 1960's. Shows the designing and building of the spacecraft, the training of the seven original astronauts, the MR-2 launch with the chimp Ham, and highlights of Alan Shepard's first flight, as well as the flights of other Mercury astronauts.

Episode 5: Gemini Science

30 minutes/1982 | 1/2" VHS | 099.03-05V | **16.00**
Level: Grades 4–Adult

Presents explanations by scientists of life science experiments developed for the Gemini missions. Includes a brief synopsis of the missions.

	Format	Item No.	Price

Episode 6: Life on the Moon?

30 minutes/1982 | 1/2″ VHS | 099.03-06V | **16.00**
Level: Grades 1–Adult

Focuses on the importance and function of the Lunar Receiving Lab. Moon rocks and soil samples are taken to the Lunar Receiving Lab in Houston, where vast amounts of geological and botanical work is conducted to determine whether the Moon will sustain life.

Episode 7: Our Laboratories in Space

30 minutes/1982 | 1/2″ VHS | 099.03-07V | **16.00**
Level: Grades 4–Adult

Examines some of the scientific and medical experiments that were completed on Skylab, the Apollo-Soyuz Test Project, and future experiments to be conducted on the Space Shuttle.

Episode 8: Examination of Life

30 minutes/1982 | 1/2″ VHS | 099.03-08V | **16.00**
Level: Adult

Focuses on university and NASA scientists of the 1960's exploring the origin of life.

Episode 9: Life Elsewhere?

30 minutes/1982 | 1/2″ VHS | 099.03-09V | **16.00**
Level: Grades 12–Adult

Explores the possibility of life on other planets.

Episode 10: Life on Three Planets Beyond Earth

30 minutes/1982 | 1/2″ VHS | 099.03-10V | **16.00**
Level: Grades 11–Adult

Explores the possibility of life on Jupiter, Venus, and Mars.

Episode 11: Universe

30 minutes/1976 | 1/2″ VHS | 099.03-11V | **16.00**
Level: Grades 4–Adult

Briefly examines the planets, with emphasis on Mars and Jupiter. Proceeds to explore our solar system, including galaxies, nebulae, pulsars, black holes, and the Sun.

Episode 12: Possible Futures in Space

30 minutes/1982 | 1/2″ VHS | 099.03-12V | **16.00**
Level: Grades 9–Adult

Contemplates futuristic ideas for our exploration and exploitation of space, including space tugs and space stations. Highlights terrafarming and methods of colonizing foreign worlds.

	Format	Item No.	Price

Episode 13: Extraterrestrials?

30 minutes/1982 | 1/2" VHS | 099.03-13V | **16.00**
Level: Grades 7–Adult

Contemplates the imagination as it relates to the progress of humankind. Science fiction works, such as Jules Verne's From the Earth to the Moon and H. G. Welles' The War of the Worlds, have played a role in our progress. Copernicus and others whose images came true and changed our concept of the universe are featured.

Episode 14: Teacher Silent Video Lesson Guide

30 minutes/1982 | 1/2" VHS | 099.03-14V | **16.00**
Level: Adult

Consists of questions, definitions, and student activities that teachers can use to plan lessons around the "Life in the Universe" series.

	Format	Item No.	Price
25 Years of Progress			
14-part series condensed onto 4 videocassettes 7 hours with printed lesson guide	1/2″ VHS	099.04 V	**60.00**

Individual Episodes

Episode 1: The Birth of NASA

30 minutes/1983 Level: Grades 7–12	1/2″ VHS	099.04-01V	**16.00**

Highlights the beginning of NASA (1958) and its early programs, including the introduction of a quality control program.

Episode 2: The Moon a Goal

30 minutes/1983 Level: Grades 7–12	1/2″ VHS	099.04-02V	**16.00**

Covers the fledgling organization, NASA, reaching several milestones in 1960–61. These milestones included two highly successful unmanned orbital flights, the world's first weather and passive communications satellite, and two manned suborbital flights.

Episode 3: Around the World and on the Way

30 minutes/1983 Level: Grades 7–12	1/2″ VHS	099.04-03V	**16.00**

Details John Glenn's first Earth orbit.

Episode 4: Preparing for the Moon

30 minutes/1983 Level: Grades 7–12	1/2″ VHS	099.04-04V	**16.00**

Illustrates continued improvements to the liquid hydrogen/oxygen rocket. Examines lunar photographs taken by Ranger 7, the tests performed on three Saturn rockets, and the plans that were made for Surveyor's landing on the Moon's surface.

Episode 5: Gemini—The Twins

30 minutes/1983 Level: Grades 7–12	1/2″ VHS	099.04-05V	**16.00**

Details the 1964–66 two-person Gemini spaceflights, which provided scientists and astronauts with valuable information and experience. The soft landing of Surveyor I on the Moon in 1966 paved the way for manned lunar landings.

Episode 6: Around the Moon

30 minutes/1983 Level: Grades 7–12	1/2″ VHS	099.04-06V	**16.00**

Details the events of a 1967 preflight test of Apollo spacecraft, during which a fire erupted in the command module, resulting in the death of three astronauts. Because of this tragedy, the Apollo spacecraft was redesigned. In 1968, the Apollo program gained momentum with two unmanned and two manned spaceflights. Apollo 8 astronauts circled the Moon 10 times.

	Format	Item No.	Price
Episode 7: Moon Landing 30 minutes/1983 Level: Grades 7–12	1/2" VHS	099.04-07V	**16.00**

Focuses on the first lunar landing in 1969. Describes the steps NASA took to pursue research in aeronautics and satellite technology in the early 1970's.

Episode 8: More Moon Exploration 30 minutes/1983 Level: Grades 7–12	1/2" VHS	099.04-08V	**16.00**

Provides highlights of 1972–73, when Mariner 9 mapped the entire surface of Mars and Pioneer 10 returned the first closeup pictures of Jupiter.

Episode 9: Transition Years 30 minutes/1983 Level: Grades 7–12	1/2" VHS	099.04-09V	**16.00**

Depicts the Apollo-Soyuz mission, which marked the first joint U.S./USSR space mission. Highlights the two Viking spacecraft that landed on Mars to conduct the first extensive search for life on that planet.

Episode 10: Shuttle Preparation and Planets 30 minutes/1983 Level: Grades 7–12	1/2" VHS	099.04-10V	**16.00**

Examines Voyager I and II, as they were launched toward Jupiter and Saturn. Each spacecraft carried a copper record, which was intended to serve as a greeting to other life forms.

Episode 11: Planetary Discoveries 30 minutes/1983 Level: Grades 7–12	1/2" VHS	099.04-11V	**16.00**

Overviews NASA technology during 1979 and 1980. Some of the highlights include Voyager's flyby of Jupiter, Pioneer's flyby of Saturn, the building of the space telescope, preparations for the first Shuttle flight, the reentry of Skylab, the launch of SOLARMAX, and many NASA spinoffs.

Episode 12: The Shuttle Era 30 minutes/1983 Level: Grades 7–12	1/2" VHS	099.04-12V	**16.00**

Presents the first years of the Space Shuttle. With the premier flight of Columbia in April 1981, the era of the reusable space transportation system began. Seven months later, Columbia was spaceborne again. Three more Shuttle flights followed in 1982.

Episode 13: Space Shuttle Matures 30 minutes/1983 Level: Grades 7–12	1/2" VHS	099.04-13V	**16.00**

Covers NASA's 25th year (1983), when the space agency maintained its momentum of achievement. Pioneer 10 became the first artificial object to leave the solar system. Challenger, the second Shuttle in a fleet to eventually number four, embarked on its first flight in April 1983.

	Format	Item No.	Price
Episode 14: Teacher Silent Video Lesson Guide			
30 minutes/1983 Level: Adult	1/2" VHS	099.04-14V	**16.00**

Consists of questions, definitions, and student activities that teachers can use to plan lessons around the "25 Years of Progress" series.

	Format	Item No.	Price
NASA and the Airplane			
13-part series condensed onto 4 videocassettes 6 1/2 hours	1/2" VHS	099.05 V	**60.00**

Individual Episodes

Episode 1: Golden Days of Flight (Paul Garber Interview)

30 minutes/1981 — 1/2" VHS — 099.05-01V — **16.00**
Level: Grades 9–Adult

Traces the first days of powered flight. Narrated by Paul Garber, an aeronautical pioneer.

Episode 2: America's Wings

30 minutes/1976 — 1/2" VHS — 099.05-02V — **16.00**
Level: Grades 9–Adult

Discusses aerodynamics and airplane wing design. Presents commentaries from key research personnel whose contributions were historically significant in the development of the modern airplane wing: Igor Sikorsky, who invented the helicopter; James Osborne, whose small suggestion helped make jet transports flyable; Eastman Jacobs, whose wind tunnel work in the 1930's established the shape of airfoils; Adolph Busemann, who thought of the swept wing; Kelly Johnson, who designed 40 airplanes; and Richard Whitcomb, who conceived the idea for the supercritical wing, the "coke-bottle" fuselage, and the winglet.

Episode 3: The 60's Strides Towards the Future

30 minutes/1984 — 1/2" VHS — 099.05-03V — **16.00**
Level: Grades 9–Adult

Views one of the most progressive decades of the century for aeronautics. Details the use of wind tunnels for research and development.

Episode 4: X-15 Research

30 minutes/1966 — 1/2" VHS — 099.05-04V — **16.00**
Level: Grades 9–Adult

Examines the remarkable half-plane, half-rocket and includes dramatic photography of flights to the edge of space.

Episode 5: Quieter, Faster and Safer Aircraft

30 minutes/1984 — 1/2" VHS — 099.05-05V — **16.00**
Level: Grades 9–Adult

Describes NASA projects to reduce jet engine noise, develop planes that can travel faster, and improve aircraft safety.

Episode 6: Hang Gliders, Copters and Underwater Planes

30 minutes/1984 — 1/2" VHS — 099.05-06V — **16.00**
Level: Grades 9–Adult

Highlights research to decrease the number of air crashes with dramatic film. Includes land- and sea-based research, as well as airborne experiments.

	Format	Item No.	Price
Episode 7: Flying Machines			
30 minutes/1978 Level: Grades 9–Adult	1/2″ VHS	099.05-07V	**16.00**

Examines aviation as it exists today and the technological advances that will impact aviation in the future. The tape briefly describes wind tunnels, powerplants, safety, comfort, economy, and noise abatement. NASA aeronautical research has answered some tough questions and is looking forward to solving current problems innovatively.

Episode 8: Looking Ahead and Back			
30 minutes/1984 Level: Grades 9–Adult	1/2″ VHS	099.05-08V	**16.00**

Provides a look at the future and what it may hold for NASA, as well as a look at past accomplishments.

Episode 9: Setting the Stage for the Future			
30 minutes/1984 Level: Grades 9–Adult	1/2″ VHS	099.05-09V	**16.00**

Presents several NASA projects scheduled for the duration of the 1980's. Airplane computers and the XV-Tiltrotor are two of the subjects discussed.

Episode 10: Behind the Scenes at the Air & Space Museum			
30 minutes/1984 Level: Grades 9–Adult	1/2″ VHS	099.05-10V	**16.00**

Discusses the development of the Smithsonian's National Air and Space Museum in Washington, D.C. Presented by E. T. Wooldridge, Director of Aeronautics at the National Air and Space Museum.

Episode 11: Progress in Aeronautics			
30 minutes/1984 Level: Grades 9–Adult	1/2″ VHS	099.05-11V	**16.00**

Examines how NASA works to improve aircraft performance and safety. By using computer technology, physical sciences, testing, and human ingenuity, NASA continues to make aircraft safer, faster, and more economical.

Episode 12: The Ames Research Fleet			
30 minutes/1984 Level: Grades 9–Adult	1/2″ VHS	099.05-12V	**16.00**

Describes how various NASA Ames Research Center aircraft are used for research in the fields of astronomy and Earth studies.

Episode 13: Astounded at the Past			
30 minutes/1987 Level: Grades 9–Adult	1/2″ VHS	099.05-13V	**16.00**

Provides a montage of aviation research and technology development. Aircraft research has come a long way since the Wright Brothers and Kitty Hawk. Possible advantages in fuel saving and speed may be embodied in future commercial airliners with advanced high-speed propellers and smaller swing-wing aircraft.

	Format	Item No.	Price
Moonwalk			
4-part series condensed onto 1 videocassette 2 hours	1/2″ VHS	099.06 V	**32.00**

Individual Episodes

Episode 1: The Day Before

30 minutes/1970 Level: Grades 9–Adult	1/2″ VHS	099.06-01V	**16.00**

Highlights the mood of the people during the long-awaited Apollo 11 mission. This unprecedented journey captured the heart of all the world.

Episode 2: Adapting to a Space Environment

30 minutes/1970	1/2″ VHS Level: Grades 4–Adult	099.06-02V	**16.00**

Examines the testing procedures Apollo operators used to simulate the space environment. Also details the functions of the different stages of the Moon rocket.

Episode 3: One Small Step

30 minutes/1970 Level: Grades 4–Adult	1/2″ VHS	099.06-03V	**16.00**

Focuses on Neil Armstrong's historical first step on the Moon's surface.

Episode 4: The Moon on Earth

30 minutes/1970 Level: Grades 4–Adult	1/2″ VHS	099.06-04V	**16.00**

Examines the research conducted on Moon rocks returned by the Apollo 11 mission. The studies revealed many aspects of the Moon's characteristics.

	Format	Item No.	Price
NASA Biology: On Earth and in Space			
14-part series condensed onto 4 videocassettes 7 hours	1/2″ VHS	099.07 V	**60.00**

Individual Episodes

Episode 1: Life in Space

30 minutes/1987 Level: Grades 10–Adult	1/2″ VHS	099.07-01V	**16.00**

Highlights with Frederick Durant III, former Director of Aeronautics, National Air and Space Museum, the history of spaceflight.

Episode 2: Gravity and Life

30 minutes/1987 Level: Grades 10–Adult	1/2″ VHS	099.07-02V	**16.00**

Presents Dr. Richard Keefe, professor of anatomy, Case Western Reserve University, explaining the role of gravity in the development of life.

Episode 3: Making Medicine in Space

30 minutes/1987 Level: Grades 10–Adult	1/2″ VHS	099.07-03V	**16.00**

Explains how medicine can be made economically in space, with Dr. Charles Walker, Shuttle Payload Specialist, McDonnell Douglas Corporation.

Episode 4: Earth's Air

30 minutes/1987 Level: Grades 10–Adult	1/2″ VHS	099.07-04V	**16.00**

Presents Joel Levine, Langley Research Center, who describes the composition of the Earth's atmosphere and its changes over geologic time, using video imagery.

Episode 5: Earth's Future Climate

30 minutes/1987 Level: Grades 10–Adult	1/2″ VHS	099.07-05V	**16.00**

Presents Dr. James Kasting, Ames Research Center, who discusses Earth's carbon dioxide cycle and its relation to the "greenhouse effect."

Episode 6: Origins of Life on Earth

30 minutes/1987 Level: Grades 10–Adult	1/2″ VHS	099.07-06V	**16.00**

Presents Dr. Antonio Lascano, the University of Mexico, who describes possible origins of life on Earth.

	Format	Item No.	Price

Episode 7: Exobiology

30 minutes/1987 1/2" VHS 099.07-07V **16.00**
Level: 10–Adult

Discusses problems human beings may face during long spaceflights, with Dr. Donald DeVincenzi, Chief of Biological Research, NASA Headquarters.

Episode 8: The Human Machine in Space

30 minutes/1987 1/2" VHS 099.07-08V **16.00**
Level: Grades 10–Adult

Presents Dr. James Logan, Chief of the Medical Operations Branch, at Johnson Space Center, who discusses how human organisms function during space travel.

Episode 9: The Viking Expeditions

30 minutes/1987 1/2" VHS 099.07-09V **16.00**
Level: Grades 10–Adult

Describes unmanned missions to Mars and search for life, with Dr. Gerald Soffen, Goddard Space Flight Center.

Episode 10: The Mars Panel Discussion, Part I

30 minutes/1987 1/2" VHS 099.07-10V **16.00**
Level: Grades 10–Adult

Presents Dr. Carl Sagan moderating a discussion by five space research scientists on future exploration of Mars.

Episode 11: The Mars Panel Discussion, Part II

30 minutes/1987 1/2" VHS 099.07-11V **16.00**
Level: Grades 10–Adult

Presents Dr. Carl Sagan moderating a discussion by five space research scientists on future exploration of Mars.

Episode 12: In Search of Extraterrestrial Intelligence (Dr. Seeger's View)

30 minutes/1987 1/2" VHS 099.07-12V **16.00**
Level: Grades 10–Adult

Describes NASA's program for listening to radio signals from space in search of extraterrestrial intelligence, with Dr. Charles L. Seeger, professor of physics and astronomy, San Francisco State University.

Episode 13: Planning for the Future

30 minutes/1987 1/2" VHS 099.07-13V **16.00**
Level: Grades 10–Adult

Presents Jesco Von Putkamer, NASA Headquarters, who discusses the humanistic and intellectual benefits of space exploration. Focuses on NASA's plans for a permanent, manned space station.

	Format	Item No.	Price
Episode 14: Space Policy 30 minutes/1987 Level: Grades 10–Adult	1/2″ VHS	099.07-14V	**16.00**

Presents Dr. John Logsdon, Director of Graduate Programs in Science, Technology and Public Policy at George Washington University, discussing space policy and its importance.

	Format	Item No.	Price
Mission EarthBound Videoconference Series			
6-part series condensed onto 3 videocassettes 6 hours with printed lesson guide	1/2" VHS	099.11 V	**60.00**

Offers distance-learning programming designed for participants to upgrade content knowledge and instructional skills through an Earth system science investigation relating human influence to global climate change. Serves as both student enrichment and staff development. Through animated vignettes, participants are introduced to the planet Earth and the Earth system from the perspective of two alien students—Baryon and Hadron—on the ultimate science field trip. Viewers accompany Baryon and Hadron in their exploration of specific aspects of global environmental change. In addition, Dr. Joel Levine, a NASA atmospheric science expert, offers viewers additional insight into global change issues engaging in dialog with both studio audiences and telephone viewers.

Individual Episodes

Episode 1: Mission EarthBound

Introduces the notion of global change, defines the term "atmosphere," and provides the foundation for deeper investigation in the remaining programs of the series.

Episode 2: Earth's Atmosphere: A Cosmic Perspective

Explores the origin, evolution, and resulting composition and dynamics of Earth's unique atmosphere. Includes contrasts and comparisons with atmospheres that have developed on the other planets of our solar system.

Episode 3: Atmospheric Ozone: What Is It and What Is Happening to It?

Describes the function and significance of ozone in safeguarding life on our planetary home. Models the interactions, both natural and human-induced, that result in the creation and destruction of atmospheric ozone.

Episode 4: Climate Systems/Climate Modeling

Examines the complex web of interacting variables that give rise to what is known as "climate." Includes historical trends and predictions of future temperatures and sea levels.

Episode 5: Green House Gasses/Climate Change

Investigates the origin and role of greenhouse gases that generate the Earth-warming greenhouse effect. Includes computer database modeling and the upbeat "Global Challenge" music video.

Episode 6: Challenges/Solutions to Global Atmospheric Change

Briefly summarizes content provided in programs one through five and addresses the impact on global change of political, social, and economic action and education from a worldwide perspective.

	Format	Item No.	Price
Live From Antarctica Videoconference			
Purchase as a 4-part set on 2 videocassettes	1/2" VHS	099.13 V	**40.00**
Level: Grades 6–12	4 hours		

Individual Tapes and Programs

Tape 1
Program 1: The Coldest, Windiest, Iciest Place on Earth

60 minutes — 099.13-01V — **21.00**
Broadcast December 13, 1994

Introduces and explores the geology, climate, location, scale, and history of the coldest, windiest, highest continent on Earth; one with 70 percent of all the world's fresh water, 90 percent of Earth's ice, and regions drier than the Gobi Desert. Antarctica plays a crucial role in global climate and holds clues to our planet's future. And while today it seems locked into its icy identity, it was once very different, a reminder of how drastic planetary climate changes can be. In this program, students will learn how and why Antarctica has changed over time, how ancient continents formed and broke up, and what Antarctica can reveal about Earth today and in the future.

Program 2: Life in Antarctica, Then and Now

60 minutes
Broadcast December 15, 1994

Shows that as Antarctica changed from a tropical forest, its plants and creatures evolved and adapted or died out. David Harwood and his team go fossil hunting in the Transantarctic Mountains, the site of the most spectacular scenery on the continent. Looks at one of the most interesting contemporary Antarctic life forms, the Emperor penguin, with expert Gerry Kooyman, and in McMurdo's aquarium one particularly unique adaptation—fish with organic antifreeze! Explores one of Antarctica's most unusual areas, the Dry Valleys, where life survives inside rocks or at the bottom of lakes that are perpetually covered by ice. Diane Freckman of biologist Robert Wharton's Long-Term Ecological Research project shows us the ongoing environmental survey under way in the Dry Valleys, as well as what researchers hope to learn through careful observation over many years.

Tape 2
Program 3: Spaceship South Pole

60 minutes — 099.13-02V — **21.00**
Broadcast January 10, 1995

Shows that surviving at the South Pole is about as good an analogy for living and working in space as can be found anywhere on Earth. The video crew spent the holidays at America's Amundsen-Scott South Pole Station. Students, of course, know what the holiday is like at the North Pole, but this will be a revealing and realistic look at the other end of the planet! Shows what the 150 or so scientists and support staff in residence wake up to on December 24, as well as everyday life and work in some of the most extreme conditions anywhere on Earth. The National Science Foundation (NSF) has begun a total redesign of the South Pole Station, to make it safer, more energy-efficient, and better equipped with telecommunications tools to upgrade support for science. Reveals why the new living modules are raised high on stilts and why all other buildings will be situated "under ice." NASA is collaborating with NSF to make the new station far more self-sufficient in food and water, including ideas for an edible "park"!

Format	Item No.	Price

Program 4: From Pole to Planet

60 minutes
Broadcast January 19, 1995

Proves that Antarctica is a place to not only study the history of our universe, as shown in Program #3, but also to consider the future of our home planet. Governed by international treaty and dedicated to peaceful scientific research, Antarctica is a unique resource for all Earth's people—a "canary in the mine shaft" that can alert us to the consequences of actions that may impact the global climate system. What are we learning from studies of the West Antarctic ice sheet? If climate change is driven to extremes, will the Antarctic ice caps start to melt and flood Earth's coastal cities? Shows what life is like at a 55-person deep field camp, where ice-drilling and seismic testing probe what lies beneath the surface. Flying in specially equipped aircraft, scientists try to determine whether volcanic heat drives the ice streams.

	Format	Item No.	Price
Live From the Stratosphere Videoconference			
Level: Grades 6–12 Teacher's guide with activities		099.14 P	**10.00**

Individual Tapes

Tape 1: Science in the Stratosphere

30 minutes
Broadcast September 19, 1995

099.14-01V **10.00**

Serves primarily as a teacher resource tape. Includes an introduction to the Kuiper Airborne Observatory (KAO), airborne astronomy, and the electromagnetic spectrum. Demonstrates hands-on activities found in the teacher's guide and information on on-line resources and how to access them.

Tape 2: The Pre-Flight Briefing

60 minutes
Broadcast October 5, 1995

099.14-02V **16.00**

Offers a tour of the aircraft and shows how the telescope is mounted and how it operates. Describes where the KAO will fly and how students can plot its path. This live program originates from the hangar at NASA Ames Research Center, the KAO's home base, and includes live interaction from around the country by phone, fax, and e-mail.

Tape 3: The Jupiter Mission

150 minutes (on two tapes)
Broadcast October 12, 1995

099.14-03V **21.00**

Allows the viewer to join the KAO in flight for observations of Jupiter and its moons. Live video uplinks feature on-camera interactions with astronomers, crew, teacher, and student on board the KAO. Includes demonstrations of hands-on activities relating to the KAO mission and on-line collaborations over the Internet with other live sites. The KAO will land in Houston just before 5:00 p.m. Eastern.

Tape 4: Night Flight to the Stars

300 minutes (on four tapes)
Broadcast October 13, 1995

099.14-04V **36.00**

Explores the life cycle of the stars, studying the planet Saturn and its giant moon, Titan. Students control the airborne telescope remotely, over the Internet, in a demonstration of "telescience." Live pictures transmitted over the Internet from an observatory provide ground-based comparison images for some of the objects seen by the KAO in infrared. The KAO will land at NASA Ames, concluding the "Live From the Stratosphere" observing flights and the first ever interactive television project involving an aircraft in flight.

Tape 5: Return to the Stratosphere

60 minutes
Broadcast October 31, 1995

099.14-05V **16.00**

Serves as a compilation of all the previous programming to provide a resource for teachers whose classes were unable to participate in the live events. The program also indicates the continuing availability of on-line materials and suggests ways to integrate print, video, and on-line materials to engage student interest.

	Format	Item No.	Price

Live From the Hubble Space Telescope Videoconference

Visit their World Wide Web Site at http://quest.arc.nasa.gov/livefrom/hst.html

	Teacher's guide with activities	099.15 P	**10.00**

Individual Tapes

Tape 1: The Great Planet Debate

	30 minutes Broadcast November 9, 1995	099.15-01V	**10.00**

Introduces the entire project and announces the on-line discussion that led to a December 1995 consensus decision about which planets to observe. The four astronomers who served as "planet advocates" for the on-line debate each presented reasons for using three Hubble orbits for "their" planet and summarized key scientific goals that could be achieved.

Tape 2: Making Your Observations

	60 minutes Broadcast March 14, 1996	099.15-02V	**16.00**

Offers a live interactive telecast, linking students to the Space Telescope Science Institute to witness the acquisition of their data. Climaxes with a live "first look" at the original astronomical data acquired as a result of the "Passport to Knowledge" observations.

Tape 3: Announcing Your Results

	60 minutes Broadcast April 23, 1996	099.15-03V	**16.00**

Interactively enables students to interpret and understand their observations, enhanced by image processing.

For information on future electronic field trips, contact:

Geoffrey Haines-Stiles
Passport to Knowledge
41 Rowan Road
Summit, NJ 07901
(908) 273-4108

	Format	Item No.	Price
NASA CONNECT Series 1997–98			
2 hours/1997			
Level: Grades K–4	1/2" VHS	099.18 V	**32.00**
Level: Grades 5–8	1/2" VHS	099.19 V	**32.00**

Consists of four 30-minute interactive programs delivered to K–4 and 5–8 audiences. The four programs are preceded by an introduction designed to orient teachers to the Connect Series. Each program in the series will feature one of the four NASA Strategic Enterprises: Aeronautics and Space Transportation Technology, Earth Science, Human Exploration and Development of Space, and Space Science. It is this "content" that drives the uniqueness of the CONNECT programs. Includes an Educator's Guide. Series objectives include:

1. Demonstrate the connection between the concepts and skills taught in the classroom and their application in the workplace
2. Address specific national mathematics standards and support State curriculum frameworks and standards
3. Actively engage students in problem solving, mathematical reasoning, and the communication of mathematics
4. Build activities within the program's design that encourage students to apply mathematical operations involving number sense and numeration, measurement, statistics and probability, patterns, and relationships

NASA CONNECT Individual Program Descriptions

Introduction: Teacher's Guide to the Series

This teacher's introduction explains the program's components and suggests ways for teachers to "connect" to NASA to experience exciting research first hand.

Program 1: Flight Direction

Demonstrates that NASA engineers and pilots constantly experiment with test designs and materials to make the best airplanes. Their experiments are done over long periods of time. They change their experiments by varying the conditions. In this program, students will be introduced to and learn from former NASA test pilot Lee Person. They will observe students conducting a paper airplane experiment under different flight conditions. By working in pairs or small groups, viewers will better understand how research teams of NASA engineers, technicians, and pilots must work together to complete large projects involving airplanes.

Program 2: Planetary Landers

Helps students explore the design considerations that go into constructing a planetary lander and examine the mathematics behind the landing process. They will observe students conducting an experiment to investigate mass and velocity, in which different objects are dropped onto a "Martian" surface. By working in pairs or small groups, viewers will better understand how research teams of NASA scientists, technicians, and engineers must work together to complete large projects involving planetary landers.

Program 3: Earth From Space

Helps students explore how scientists have used satellites to study the impact of human activities on the global climate and examine the mathematics behind the collected data from space-based instruments to study Earth's environment. Students will observe student "researchers" conducting an experiment to investigate the differences in distances traveled by rubber-band rockets when the launch angle and the amount of force vary. By working in pairs or small groups, viewers will better understand how research teams must work together to conduct investigations.

	Format	Item No.	Price

Program 4: Doing More in Less

Helps students explore the concept of microgravity. Students will observe student "researchers" conducting an experiment to investigate the effects of varying the amount of fuel (fizzing antacid tablets) on the difference in time from fuel ignition to landing. By working in pairs or small groups, viewers will better understand how research teams must work together to conduct investigations.

NASA CONNECT Video Series 1998-99

150 minutes/1999 | 1/2" VHS | 099.20 V | **24.00**
Level: Grades 5–12

NASA CONNECT 1998-99 is a series of five interactive 30-minute instructional programs that use NASA projects, facilities, and researchers to enhance the teaching of math and science for students in grades 4–8. NASA CONNECT links math and science concepts and skills to the workplace, joins classrooms with NASA researchers, and supports national math and science standards. Each program includes a lesson, a classroom experiment, and a web-based, online, interactive component. Purchase as a complete set, or individually listed below:

Introduction: Teacher's Guide to the Series

This teacher's introduction explains the program's components and suggests ways for teachers to "connect" to NASA to experience exciting research first hand.

NASA CONNECT Individual Program Descriptions

Program 1: Plane Weather

30 minutes/1998 | 1/2" VHS | 099.20-01V | **16.00**
Level: Grades 5–12

Involves students in the examination of aviation safety. Introduces students to the math and science behind aviation weather and demonstrates how meteorological conditions, such as icing, influence flight. Students explore the relationship between science and technology and the tools, techniques, and technologies used by engineers to study aircraft icing to reduce its effect on aircraft operations. Includes an Educator's Guide.

Program 2: The Shape of Flight

30 minutes/1998 | 1/2" VHS | 099.20-02V | **16.00**
Level: Grades 5–12

Introduces students to the wind tunnel and the computer, two of the tools used by aeronautical engineers to measure the fundamental design characteristics of experimental and production aircraft. The lesson and classroom experiment will involve students in observation, measuring, organizing, comparing, and interpreting data. Includes an Educator's Guide.

Program 3: Wherever You Go, There You Are

30 minutes/1999 | 1/2" VHS | 099.20-03V | **16.00**
Level: Grades 4–8

Introduces students to the science of navigation and involves them in observing, measuring, and interpreting data to determine exact locations. NASA researchers will show students how math, science, and geography combine to make navigating safer and easier. Students will see how various professionals involved in the science of navigation require the use of math, science, and geography to get from one destination to another. They will learn how Global Positioning Satellites (GPS) now make navigation much easier and safer for civil, commercial, and military pilots. Students will plot a course by using a compass, a compass rose, and a transit. They will be actively involved in organizing, comparing, and interpreting data. Includes an Educator's Guide.

	Format	Item No.	Price
Program 4: Recipes for the Future			
30 minutes/1999 Level: Grades 4–8	1/2" VHS	099.20-04V	**16.00**

"Recipes for the Future" focuses on the physical properties of materials, mixtures, and compounds. Students are introduced to the various measuring and testing techniques used to develop "composite" materials for airplanes and space vehicles. NASA researchers will show students how recipes for the future begin with the identification of requirements, the selection of proper ingredients, and the application of proper processing, fabrication, and analysis procedures. Students will conduct an experiment designed to investigate the strength and maximum deflection of a composite material with and without the use of a reinforcer.

Program 5: Quieting the Skies			
30 minutes/1999 Level: Grades 4–8	1/2" VHS	099.20-05V	**16.00**

NASA engineers and scientists are trying to design airplanes to run as quietly as cars. In this program, students will learn the basics: what sound is, what makes sound, how sound affects us and the environment, and how we measure sound. They will also learn some of the techniques being used by NASA to reduce aircraft noise. The lesson and classroom experiment will involve students in the creation, visualization, and measurement of sound.

Station Reel Time Series			
Series condensed onto 1 videocassette Level: Grades 3–8	1/2" VHS	099.21 V	**16.00**

This multiple-part series consists of short programs highlighting different aspects of the International Space Station. As episodes are produced, they will be added to the series automatically.

Program 1: Crew Return Vehicle

This program takes a look at some of the key features of the International Space Station Crew Return Vehicle, the X-38. The X-38 is compared to a lifeboat in space because it will be used to carry the crew back to Earth in the event of an emergency aboard the Space Station. It highlights the parafoil parachute used for landing, the automated landing system, and the shape and size of the spacecraft. Accompanied by NASA Education Brief EB-1998-11-127-HQ/International Space Station Crew Return Vehicle: X-38.

Program 2: Power Systems

Examines how electricity will be generated on the International Space Station. The Space Station is the largest structure ever built in space. It will be powered by eight solar panels that collect energy from the sun through the use of photovoltaic cells. Photovoltaic cells are used on Earth too, in toys, solar calculators, at school crossings, and many other places. Once the energy is collected it will be used to charge batteries that will provide power to the Space Station when it is not in direct sunlight. Batteries are also used when more power is needed for experiments and research. The other half of the power produced will go directly to the laboratories and modules, or rooms of the Space Station. This power will also run the life support systems,which includes the air the astronauts will breath, the food systems, and the temperature controls. Accompanied by NASA Education topic ET-1998-07-003-HQ/From Sunlight to Power: International Space Station Solar Arrays.

	Format	Item No.	Price
Skylab Science Demonstration 6-part series condensed onto 1 videocassette 1 1/2 hours	1/2" VHS	099.91 V	**24.00**

Covers the world's first laboratory in space. During the summer of 1973, astronauts Alan Bean, Jack Lowsna, and Dr. Owen Garriott spent almost 2 months aboard the Skylab spacecraft. During this mission, Dr. Garriott conducted a number of science experiments specifically intended for high school science students. The programs highlight these experiments and are accompanied by a printed teacher's guide.

Individual Episodes

Episode 1: Zero-G

17 minutes/1974 Level: Grades 9–Adult	1/2" VHS	099.91-01V	**15.00**

Provides an introduction to the Skylab environment, a laboratory above the Earth's atmosphere, effectively free from the Earth's gravitational field. Dr. Garriott briefly explains the dynamics of Earth orbit and the meaning of zero -gravity (weightlessness) and shows brief demonstrations of phenomena that can be observed only in zero-gravity.

Episode 2: Conservation Laws in Zero-G

17 minutes/1974 Level: Grades 9–Adult	1/2" VHS	099.91-02V	**15.00**

Demonstrates the concept of angular momentum conservation from the zero-gravity environment of the orbiting Skylab space station. Illustrations in space are related to more familiar examples on Earth. Also shows how the spinning motion of a satellite changes to tumbling by dissipation of rotational energy while angular momentum is conserved.

Episode 3: Fluids in Weightlessness

15 minutes/1974 Level: Grades 9–Adult	1/2" VHS	099.91-03V	**15.00**

Explores numerous fluid phenomena in orbit, including surface tension, cohesion, adhesion, and instability. Demonstrates how collisions and splittings of liquid drops in orbital zero-gravity can model systems ranging in size from an atomic nucleus to a galaxy.

Episode 4: Gyroscopes in Space

17 minutes/1974 Level: Grades 9–Adult	1/2" VHS	099.91-04V	**15.00**

Uses gyroscope demonstrations in the zero-gravity Skylab orbit to explain both the principles and applications of gyroscopes on Earth. The fascinating motion of gyroscopes is useful in everyday life and essential to aviation and space travel.

Episode 5: Magnetism in Space

20 minutes/1975 Level: Grades 9–Adult	1/2" VHS	099.91-05V	**16.00**

Opens with a montage of spectacular views of Skylab in orbit. Reviews familiar aspects of magnetism, touches lightly on its history, and explores the striking behavior of magnets in weightlessness.

	Format	Item No.	Price
Episode 6: Magnetic Effects in Space			
16 minutes/1974 Level: Grades 9–Adult	1/2″ VHS	099.91-06V	**15.00**

Demonstrates the effect of the Earth's magnetic field on small bar magnets Dr. Owen Garriott carried up in Skylab. He explains the tendency of magnets to line up with the Earth's magnetic field and shows the oscillating motions of magnets in various combinations and positions. Additionally, several demonstrations are performed with a nut spinning in space.

	Format	Item No.	Price
Starfinder Series			
30-part series condensed onto 4 videocassettes 7 1/2 hours with printed lesson guide Level: Grades 6–10	1/2" VHS	099.93 V	**65.00**

Complements existing physics and Earth science curricula and relates Hubble Space Telescope discoveries and science concepts in a timely and interesting fashion. The Maryland Department of Education, in cooperation with the Space Telescope Science Institute at Baltimore's John Hopkins University, has produced this 30-part video series to provide students with new insights into the size, formation, and make-up of the universe. Includes a 90-page teacher's guide.

Individual Titles by Tape

Tape 1

Program 1: Making Sense of Data
Program 2: Pictures From Numbers
Program 3: Why a Space Telescope?
Program 4: The Expanding Universe
Program 5: Laws of Motion
Program 6: How Big Is the Universe?
Program 7: Gravity in Space
Program 8: Orbital Motion

Tape 2

Program 9: Gravity and Weight
Program 10: Fusion Energy
Program 11: Evolution of a Star
Program 12: Tapping the Sun's Power
Program 13: Energy Transfer
Program 14: Rotational Energy
Program 15: The Nature of Light
Program 16: Earthbound Telescopes

Tape 3

Program 17: The Hubble Instruments
Program 18: Density of Matter
Program 19: Ancient Astronomers
Program 20: The Constellations
Program 21: Using the Celestial Sphere
Program 22: Magnetic Fields
Program 23: Electromagnetic Radiation
Program 24: Fingerprints of Light

Tape 4

Program 25: Solar System, Part I
Program 26: Solar System, Part II
Program 27: Conservation: Energy and Matter
Program 28: Pulsars and Quasars
Program 29: Diffraction
Program 30: Cosmology

	Format	Item No.	Price
Project Mathematics! Series			
8-part series condensed onto 2 videocassettes	1/2″ VHS	099.94 V	**32.00**
4 hours	8 Booklet Set	7099.94 P	**31.50**

There videotapes and program guides are also listed individually on pages 45-47 under "Mathematics/Physics," with brief descriptions of each title. The printed lesson guides can be purchased as a set. Copyrighted by and reproduced with permission of the California Institute of Technology.

Individual Episodes

Episode 1: The Theorem of Pythagoras			
20 minutes/1988	1/2″ VHS	012.0-01V	**16.00**
Level: Grades 9–12			
Episode 2: The Story of Pi			
25 minutes/1990	1/2″ VHS	012.0-02V	**16.00**
Level: Grades 9–12			
Episode 3: Similarity			
25 minutes/1990	1/2″ VHS	012.0-03V	**16.00**
Level: Grades 9–12			
Episode 4: Polynomials			
25 minutes/1991	1/2″ VHS	012.0-04V	**16.00**
Level: Grades 9–12			
Episode 5: Sines and Cosines, Part I			
28 minutes/1992	1/2″ VHS	012.0-05V	**16.00**
Level: Grades 9–12			
Episode 6: Sines and Cosines, Part II			
30 minutes/1993	1/2″ VHS	012.0-06V	**16.00**
Level: Grades 9–12			
Episode 7: Sines and Cosines, Part III			
30 minutes/1994	1/2″ VHS	012.0-07V	**16.00**
Level: Grades 9–12			
Episode 8: The Tunnel of Samos			
30 minutes/1994	1/2″ VHS	012.0-08V	**16.00**
Level: Grades 9–12			

	Format	Item No.	Price
Liftoff to Learning			
16-part series condensed onto 3 videocassettes 5 hours with printed lesson guide	1/2" VHS	099.95 V	**48.00**

Shows that every liftoff of the Space Shuttle is the beginning of a voyage of exploration and discovery. The experiences of Shuttle astronauts captures the imagination of students of all ages. Students study science, mathematics, and technology with crew members aboard Space Shuttle flights. Space becomes the departure point for learning, integrating many other subject areas, bringing them to life. Recognizing the potential of the Space Shuttle experience in the classroom, NASA's Education Division and the Johnson Space Center's Flight Crew Operations Directorate have joined forces to create a dynamic videotape series to support teachers in the classroom. The series captures the excitement of spaceflight and explains, in basic and practical terms, the scientific, mathematical, and technologic concepts that make spaceflight possible. These learning tools also provide concrete examples of the global perspective space flight offers and the new frontiers of research and exploration spaceflight has created. Taking advantage of state-of-the-art video production facilities and computer animation capabilities of NASA's Johnson Space Center, these programs combine the stunning visual images of spaceflight with clear and entertaining graphics. They may be purchased as a complete set, by groups of episodes, or individually as listed below.

Individual Episodes

Episode 1: Space Basics

21 minutes/1991	1/2" VHS	007.6-25V	**16.00**

Level: Grades 5–8
Application: History, Physical Science, Technology

Shows the astronauts aboard mission STS-41 using computer graphics and visual demonstration to answer four basic questions about spaceflight: How do spacecraft travel into space? How do spacecraft remain in orbit? Why do astronauts float in space? How do spacecraft return to Earth? Viewers learn how English scientist Isaac Newton formulated the basic science behind Earth orbit more than 300 years ago.

Episode 2: Go for EVA

14 minutes/1991	1/2" VHS	007.6-26V	**15.00**

Level: Grades K–8
Application: Life Sciences, Physical Science, Technology, History, Social Studies

Presents the astronauts aboard mission STS-37 discussing the reasons for wearing spacesuits during spacewalking missions, how spacesuits work, and what kinds of jobs astronauts perform while spacewalking. Actual footage of spacewalks—also known as Extravehicular Activities (EVA's)—illustrates how spacesuits allow astronauts to operate scientific apparatus, assemble equipment and structures, pilot the Manned Maneuvering Unit, take pictures, and service satellites and space hardware.

Episode 3: Newton in Space

13 minutes/1992	1/2" VHS	007.6-27V	**15.00**

Level: Grades 5–8
Application: Physical Science

Shows the astronauts on orbit during mission STS-39 demonstrating the importance of Newton's Laws of Motion to spaceflight. The program explains the difference between weight and mass, the basic principles of balanced and unbalanced forces, action and opposite reactions, and how the three laws of motions affect the way a rocket operates. Using the microgravity environment of Earth orbit, Space Shuttle astronauts conduct simple force and motion demonstrations in ways not possible on Earth.

	Format	Item No.	Price

Episode 4: All Systems Go

34 minutes/1992 | 1/2" VHS | 006.3-11V | **16.00**
Level: Grades 5–12
Application: Biology, Life Sciences

Presents the astronauts on orbit during the Spacelab Life Sciences mission discussing some of the physiological changes that occur in the human body while in a microgravity environment and attempts to answer important questions on how the body readapts to Earth's environment. The videotape shows research conducted aboard the Space Shuttle on six systems that examine the heart, lungs, blood, muscles, cells, and the immune system, among others. This program is segmented, enabling teachers to extract topics that are most relevant to current classroom studies.

Episode 5: The Atmosphere Below

16 minutes/1992 | 1/2" VHS | 002.2-14V | **15.00**
Level: Grades 5–12
Application: Earth Sciences

Shows that changes in Earth's atmosphere are investigated from outer space on board the Shuttle using the Atmospheric Laboratory for Applications and Science (ATLAS 1). Space Shuttle astronauts explain the questions scientists hope can be answered by studying Earth's atmosphere from space. Experiments discussed in this videotape focus on infrared detection of atmospheric remnants from volcanic eruptions, ozone concentration levels, and incoming solar ultraviolet radiation with respect to global warming, among others.

Episode 6: Voyage of Endeavour—Then & Now

20 minutes/1992 | 1/2" VHS | 008.0-08V | **16.00**
Level: Grades 5–12
Application: History, Social Studies, Technology

Captures the excitement of the maiden flight of NASA's Space Shuttle Endeavour and contrasts it with its namesake, the 17th century research sailing vessel commanded by James Cook. Students will experience Endeavour's historic rescue of the stranded INTELSAT VI satellite and the first three-person extravehicular activity. Cook's voyage provides an apt parallel: charting unexplored land and waters in the South Pacific, New Zealand, and Australia and using scientists and artists to collect data on plants, wildlife, and native peoples. Orbital scenes were taken during the STS-49 mission in May 1992.

Episode 7: Toys in Space II

37 minutes/1993 | 1/2" VHS | 006.3-14V | **16.00**
Level: Grades K–12
Application: Mathematics, Physical Science, Technology

Provides a hands-on way for students to investigate the principles of mathematics and science that make many common toys function. The Space Shuttle crew invite students to experiment with similar toys in their classroom and hypothesize how these same toys will operate in microgravity. Scenes of the STS-54 astronauts operating the toys in space serve as data for students to confirm or reject their hypotheses.

	Format	Item No.	Price

Episode 8: Living in Space

10 minutes/1994 | 1/2" VHS | 006.3-15V | **10.00**
Level: Grades K–4
Application: Life Sciences, Physical Science

Demonstrates what it is like to live and work in space. Viewers are invited by the Space Shuttle crew to join the astronauts as they go through their daily routine living on board the Space Shuttle. Students see the similarities and differences in eating, exercising, relaxing, maintaining personal hygiene, sleeping, and working in space versus on Earth. Orbital scenes were taken during the STS-56 mission.

Episode 9: From Undersea to Outer Space

15 minutes/1994 | 1/2" VHS | 003.1-02V | **15.00**
Level: Grades 5–8
Application: Life Sciences

Tells the story of a life sciences experiment conducted on the first Spacelab Life Sciences mission flown on the Space Shuttle. More than 2,000 jellyfish were sent in space to learn about how living things adapt to the microgravity environment of Earth orbit. Scientists examined how microgravity affects the development of young jellyfish, especially their gravity receptors. The gravity receptors of jellyfish serve a purpose similar to the inner ear of human beings for balance and orientation.

Episode 10: Tethered Satellite: A Videotape for Physics and Physical Science

Level: Grades 9–12 | 1/2" VHS | 012.0-21V | **16.00**
Application: Physical Science

Part I: Tethered Satellite: Forces and Motion
22 minutes/1995

Describes the tethered satellite concept and shows how the satellite is deployed and extended in space. The mathematics describing the forces acting on the tethered satellite/Space Shuttle orbiter system is presented.

Part II: Electrical Circuits in Space: The Electrodynamics of the Tethered Satellite
19 minutes/1997

Demonstrates how the tethered satellite and the Space Shuttle orbiter interact with Earth's magnetic field to produce an electric current. Future applications of the tethered satellite/Space Shuttle orbiter system as a motor are described.

Episode 11: Assignment Spacelab

17 minutes/1995 | 1/2" VHS | 003.1-03V | **15.00**
Level: Grades 5–12
Application: Life Sciences, Physical Science

Shows how the unique microgravity environment of Earth orbit is used for scientific experiments and how the rules of scientific experimentation and safety that apply to research on Earth also apply to astronauts in space. On-orbit scenes were taken during the STS-58 mission of Columbia.

	Format	Item No.	Price

Episode 12: Microgravity

24 minutes/1996 | 1/2″ VHS | 012.0-22V | **16.00**
Level: Grades 5–12
Application: Physical Science

Focuses on four scientific disciplines in microgravity studies: fluid physics, materials science, biotechnology, and combustion. Experiments within these disciplines explore how the effects of buoyancy-driven convection and sedimentation, seen in ground-based laboratories, are diminished in space, allowing scientists to expand their knowledge in these areas. "Microgravity" describes the restrictions that gravity imposes on scientific experimentation and how they can be greatly reduced in the exciting research environment of the Space Shuttle and later on in the International Space Station.

Episode 13: Geography From Space

15 minutes/1997 | 1/2″ VHS | 008.0-09V | **15.00**
Level: Grades K–8
Application: Earth and Space Science, Life Science in Personal and Social Perspectivers

Takes the viewer on a rapid tour of Earth's surface as seen from outer space. After explaining how the altitude of the viewer affects the amount of Earth's surface seen at one time, the video moves into a travelog on some of the interesting features of Earth's continents as seen from space. Because the inclination of the Space Shuttle's orbit to Earth's equator did not carry the crew over Antarctica or the Arctic, these are not visited in the program.

Episode 14: Mathematics of Space—Rendezvous

17 minutes/1998 | 1/2″ VHS | 012.0-23V | **15.00**
Level: Grades 5–12
Application: Mathematics

Addresses the basic mathematical operations of spacecraft rendezvous in Earth orbit. Middle school mathematics students solve problems that may occur when the Space Shuttle docks with the Russian space station *Mir*. The video has stopping points to permit viewers to work the problems. Mission STS-84 is covered, with Commander Charles Precourt, Pilot Eileen Collins, Jean-Francois Clervoy, Edward Lu, Carlos Noriega, Elena Kondakova, Jerry Linenger, and Michael Foale.

Episode 15: Let's Talk Robotics

14 minutes/1998 | 1/2″ VHS | 011.0-04V | **10.00**
Level: Grades 5–12
Application: Physical Science, Technology

Offers an introduction to the use of robots in space exploration. Astronauts demonstrate robotic arms and free-flying cameras on the Space Shuttle. Viewers also get to see some of NASA's robotics laboratories. The Mars Sojourner robot is featured, along with middle and high school students using robots.

Episode 16: Plants in Space

13 minutes/1999 | 1/2″ VHS | 003.1-10V | **15.00**
Level: Grades 5–12
Application: Life Science

Students at an elementary school participate in an experiment on plant growth with Space Shuttle astronauts. Identical seed growth pouches are planted with corn and soybean seeds. Some of the seeds are germinated on Earth and others on the Space Shuttle in Earth orbit. Rather than drawing conclusions on the effects of microgravity on plant growth, viewers are invited to participate in the experiment by growing seeds on Earth as control experiments. Accompanied by a video resource guide which provides data on the experimental plants grown in space. This data can be compared with the data collected on the control plants.

	Format	Item No.	Price

Purchase by Volume

Liftoff to Learning Volume I

1/2" VHS	099.95-01V	**21.00**

Episodes 1–6: Space Basics, Go for EVA, Newton in Space, All Systems Go, The Atmosphere Below, and Voyage of Endeavour—Then & Now.

Liftoff to Learning Volume II

1/2" VHS	099.95-02V	**21.00**

Episodes 7–12: Toys in Space II, Living in Space, From Undersea to Outer Space, Tethered Satellite: A Videotape for Physics and Physical Science, Assignment Spacelab, and Microgravity.

Liftoff to Learning Volume III

1/2" VHS	099.95-03V	**21.00**

Episodes 13–16: Geography From Space, Mathematics of Space—Rendezvous, Let's Talk Robotics, and Plants in Space.

	Format	Item No.	Price
What's in the News—Space Series 12-part series condensed onto 3 videocassettes 3 hours with printed lesson guide Level: Grades 4–Adult/1993	1/2" VHS	099.96 V	**48.00**

Offers 12 15-minute programs on space sciences and exploration that weave stunning NASA videos, demonstrations of scientific principles, and interviews with space scientists. Produced and copyrighted by WPSX-TV, Penn State's College of Education and the Pennsylvania Space Grant Consortium. Not for international or commercial distribution. Includes a comprehensive teacher's guide.

Individual Episodes

Episode 1: Introduction

Chronicles the history and milestones of flight and rocketry from the myth of Icarus to the building of an international space station.

Episode 2: Eyes on the Sky—Astronomy

Focuses on people's fascination with the universe and their study of it, from stargazing with the unaided eye to scientific exploration using the Hubble Space Telescope.

Episode 3: Gravity—A Force of Nature

Explains the concept of universal gravity, microgravity, and weightlessness using examples from Earth, such as a roller coaster, and from space, such as Skylab and Space Shuttle acrobatics.

Episode 4: Space Shuttle—Blast Off to the Future

Looks at the Space Shuttle in detail: its design and compartments, how it is fueled, and how it stays in orbit around the Earth.

Episode 5: Teamwork in Space

From astronaut to engineer to scientist, looks at the numerous people involved in the launching of a spaceship and the completion of a successful mission.

Episode 6: Spaceship Earth

Explains and compares natural and artificial ecosystems using the ocean and extravehicular mobility unit (spacesuit) as its two main examples. Includes a piece-by-piece examination of a spacesuit with a spacesuit technician.

Episode 7: Living in Space

Examines the physiological changes to the body in space, such as a shift in body fluids and the loss of calcium. Also looks at changes in everyday living, including washing, sleeping, eating, and going to the bathroom.

Format **Item No.** **Price**

Episode 8: Working in Space

Examines the effect of microgravity on astronauts' ability to work in space. Looks at important engineering designs from foothold inside the Space Shuttle to the mobile Manned Maneuvering Unit. Examines astronaut training on Earth, including tasks performed in a huge tank of water.

Episode 9: Eyes in the Sky—Communications Satellites

Looks at the ability of satellites to help us communicate with each other faster and over longer distances. Traces the path of a satellite signal from a ground station on Earth to an orbiting communications satellite in space and back down to a receiving station on Earth.

Episode 10: Eyes in the Sky—Landsurvey Satellites

Explains what a landsurvey satellite is and its ability to "see" changes in the Earth's geography over time, such as rain-forest destruction and population growth. The main scientific concepts included are electromagnetic radiation and atmospheric absorption and reflection of radiation. The career focus segment features a geographer.

Episode 11: Eyes in the Sky—Weather Satellites

Looks at the changes in weather forecasting caused by advancements in satellite technology from the early TIROS I satellite to the most modern. Includes a brief look at weather on other planets.

Episode 12: Space Exploration—The Next Frontier

Summarizes the most important ideas and scientific concepts from the preceding 11 programs and challenges students to dream about new possibilities in exploration.

	Format	Item No.	Price
The Night Sky Series			
8-part series condensed onto 1 videocassette 2 hours Level: Grades 6–12/1993	1/2" VHS	099.97 V	**32.00**

Produced at NASA's Jet Propulsion Laboratory (JPL) and hosted by David Seidel of the JPL Public Education Office, describes astronomy and space science topics, including the visibility of astronomical events, planets, stars and constellations, eclipses, observing tips, computer software, spacecraft missions, and special events. The program, produced and directed by John Stealey of the JPL Audio Visual Services Office, is produced weekly when Space Shuttle missions do not conflict, and it can be seen on NASA TV.

Individual Episodes

Episode 1: Types of Telescopes

Shows and explains refractors, binoculars, and the Newtonian, Cassegrain, and Schmidt Cassegrain telescopes.

Episode 2: A Binocular Tour Through the Night Sky

Discusses the operating principles of binoculars and the types of objects that can be viewed. Shows the planets and constellations for the week of July 12–18, 1993.

Episode 3: Observing the Night Sky

Shows "star parties" and night sky observing materials, such as star charts, from the Stoney Ridge Observatory in the southern California mountains.

Episode 4: A Conversation With John Dobson

Presents the inventor of the "Dobsonian" low-cost telescope and founder of the San Francisco Sidewalk Astronomers discussing his work to popularize astronomy.

Episode 5: Phases and Craters of the Moon

Discusses phases of the Moon and shows a simple classroom demonstration to accurately simulate phases. Another demonstration, that can be easily duplicated, illustrates impact cratering.

Episode 6: Meteors and Asteroids

Previews the 1993 Perseid meteor shower, including viewing tips and how to photograph the event. Because the Perseid meteor shower occurs annually, most of this information will be useful for years. A preview of the Galileo spacecraft encounter of the asteroid Ida is also discussed.

Episode 7: The Night Sky

Shows the stars, planets, and constellations for August 1993.

Episode 8: Total Lunar Eclipse

Presents detailed information about lunar eclipses in general and the November 1993 eclipse in particular.

	Format	Item No.	Price

The Biology and Space Exploration Video Series

6-part series condensed onto 1 videocassette 2 hours Level: Undergraduate and Graduate Students	1/2" VHS	099.98 V	**32.00**

Highlights selected aspects of life sciences and contains spaceflight footage, graphics, charts, pictures, and interviews to make the materials interesting and intelligible to viewers. This video series is part of a joint effort of NASA Ames Research Center scientists to increase public awareness and understanding of life sciences in space.

Individual Episodes

Episode 1: The Origin and Early Evolution of Life

21 minutes/1995	1/2" VHS	003.1-04V	**16.00**

Explores Earth's early stages of existence and the theories proposed to explain the evolution of life on Earth.

Episode 2: SETI: The Search for Extraterrestrial Intelligence

21 minutes/1996	1/2" VHS	003.1-05V	**16.00**

Examines how present-day technology is used to seek evidence of intelligent life elsewhere in the universe.

Episode 3: The Cardiovascular System in Space

18 minutes/1994	1/2" VHS	003.1-06V	**16.00**

Provides a detailed account of the effects of gravity on the human circulatory system. Discusses how the loss of gravity-induced blood pressure gradients led to medical problems associated with headward edema, reduced blood volume, and postflight orthostatic intolerance.

Episode 4: The Musculoskeletal System in Space

21 minutes/1995	1/2" VHS	003.1-07V	**16.00**

Discusses changes that occur in our musculoskeletal system in the absence of weight-bearing, as well as the countermeasures that can be developed to reduce muscle atrophy, bone loss and back pain in space.

Episode 5: Group Interactions and Crew Performance

23 minutes/1996	1/2" VHS	003.1-08V	**16.00**

Elaborates on group cohesion, open communication, and overall well-being among crew members. Furthermore, shows how Earth analogs can be used as models to study the psychological effects of long-term confinement.

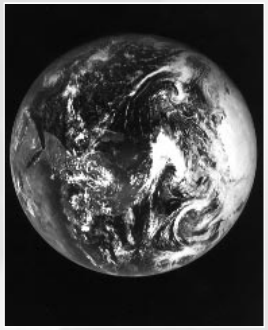
Episode 6: Life Support Systems in Space

12 minutes/1995	1/2" VHS	003.1-09V	**15.00**

Outlines the potential hazards faced by astronauts on space missions and describes the equipment required for survival in environments hostile to life.

Slide Programs





	Item No.	Price
Aeronautics: A History of Flight 46 slides with audio cassette Level: Grades 7–12	100.0-01	**13.00**

Views flight from the earliest ideas to the latest airplanes. Chronicles aviation from ancient Chinese kites to the modern airplane.

Aeronautics: Principles of Flight 70 slides with audio cassette Level: Grades 7–12	100.0-02	**18.50**

Explains aerodynamics in detail.

Human Space Flight: Living in Space 37 slides with audio cassette Level: Grades 4–12	100.0-03	**11.00**

Explain how astronauts live and work in the Space Shuttle environment.

Human Space Flight: A History 78 slides with audio cassette Level: Grades 7–Adult	100.0-05	**21.00**

Chronicles human spaceflight with emphasis on the lunar missions.

Propulsion: Principles of Rocketry 40 slides with audio cassette Level: Grades 7–12	100.0-06	**11.50**

Explains a rocket propulsion system.

Propulsion: Launch Vehicles 53 slides with audio cassette Level: Grades 7–12	100.0-07	**14.50**

Looks at past and present rockets used as launch vehicles.

Propulsion: Space Shuttle 48 slides with audio cassette Level: Grades 4–12	100.0-08	**13.50**

Highlights the NASA Space Transportation System, its functions, and possible uses for the future.

Space Exploration: The Solar System 60 slides with audio cassette Level: Grades 5–12	100.0-09	**16.00**

Analyzes information discovered about the planets.

	Item No.	Price
Space Exploration: Communications Using Spacecraft 80 slides with audio cassette Level: Grades 9–12	100.0-12	**21.00**

Focuses on communications satellites and how they benefit business, government, and the public.

***America in Space: The First 25 Years** 40 slides with audio cassette Level: Grades 4–12	100.0-14	**11.50**

Details America's long string of successful space accomplishments, including the Apollo 11 moon landing, the Voyager missions, and the Space Shuttle program.

***Moon Landing—Apollo 11** 40 slides with audio cassette Level: Grades 4–12	100.0-15	**11.50**

Tells the story of the most famous spaceflight in history, the first lunar landing.

***Viking—Mars Landing** 40 slides with audio cassette Level: Grades 4–12	100.0-16	**11.50**

Shows that the Viking 1 and 2 missions radically changed the scientific community's view of Mars, as scientists studied photos revealing giant mountains, canyons, and plains.

***The Story of the Flight of Apollo-Soyuz** 40 slides with audio cassette Level: Grades 4–12	100.0-17	**11.50**

Highlights the first meeting between America and Russia in space. Three astronauts and two cosmonauts rendezvoused in orbit, docked, and entered each other's craft.

***Voyagers Encounter Jupiter** 40 slides with audio cassette Level: Grades 4–12	100.0-18	**11.50**

Focuses on the flights of Voyagers 1 and 2 as one of the most successful and revealing unmanned spaceflight projects in history.

***Voyager 2 Encounters Saturn** 40 slides with audio cassette Level: Grades 4–12	100.0-19	**11.50**

Illustrates Voyager's most significant discoveries about Saturn, including incredible rings, erupting volcanoes, and cyclonic storms.

* Produced by Finley-Holiday Films

	Item No.	Price
***Best of the Space Shuttle 1977–1984** 40 slides with audio cassette Level: Grades 4–12	100.0-20	**11.50**

Examines Space Shuttle highlights from the first dramatic flights to the ongoing array of spectacular spacewalks and experiments.

***The Story of Our Universe** 40 slides with audio cassette Level: Grades 4 - 12	100.0-21	**11.50**

Explores the universe and all of its other worldly phenomena.

The Space Frontier 49 slides with audio cassette Level: Grades 7–12	100.0-24	**14.00**

Begins with a detailed look at Skylab and proceeds to outline the development of the space station planned for the 1990's. Highlights the uses for the future station and explains its importance to our country's future.

Milestones of Flight 38 slides with descriptions	100.0-25	**11.00**

Shows scenes from the National Air and Space Museum's "Milestones of Flight" Gallery. Produced by the Smithsonian Institution.

Fragile Earth 25 slides with descriptions	100.0-26	**8.50**

Focuses on many of the conditions that affect Earth's crust, waters, and atmosphere. Space photographs and satellite images illustrate how both nature and people have changed Earth and not always for the better. Encourages students to become active participants in restoring our sick and injured Earth to good health. Produced by the Smithsonian.

Planets 11 slides with descriptions	100.0-27	**4.00**

Presents a combination of pictures taken from spacecraft and artist's conceptions of the planets.

Stars & Galaxies 8 slides with descriptions	100.0-28	**3.50**

Shows a collection of star clusters, nebula, and galaxies. Many photos are from the U.S. Naval Observatory. Provided by NASA's Public Affairs Office.

*Produced by Finley-Holiday Films

	Item No.	Price
Earthview 4 slides with descriptions	100.0-29	**3.00**

Presents photographs of Earth taken from four different Apollo missions. Provided by NASA's Public Affairs Office.

Full Earth 6 slides with descriptions	100.0-30	**3.50**

Offers photographs of Earth taken by satellites and various Apollo missions. Provided by NASA's Public Affairs Office.

A Salute to Apollo 37 slides with audio cassette Level: Grades 7–12	100.0-31	**11.00**

Chronicles the Apollo missions, highlighting Apollo 11, the first mission to land on the Moon.

Transformations of Flight 66 slides with descriptions Level: Grades K—3	100.0-32	**22.00**

Presents the numbers 1 through 10 being transformed into 10 different important air and spacecraft in the history of flight. These slides successfully complement the videotape also found in this catalog. Produced by the Smithsonian.

***Voyager Encounters Neptune** 20 slides with descriptions	100.0-33	**8.00**

Presents color photographs taken when Voyager encountered Neptune in August 1989. Includes pictures of the Great Dark Spot, Neptune's rings, and Triton.

Astro 1: Seeing the Hidden Cosmos 24 slides with script & activity book Level: Grades 6 - 8	100.0-34	**8.50**

Describes the Astro 1 mission and basic concepts pertaining to the electromagnetic spectrum and astronomy, including x-rays, ultraviolet, visible, and infrared images of interesting astronomical objects.

***Magellan Mission to Venus** 20 slides with descriptions	100.0-37	**8.00**

Offers a variety of pictures taken of Venus when Magellan began its orbit on August 10, 1990. Synthetic aperature radar is the instrument used to look through the thick clouds perpetually shielding the surface of Venus.

ATLAS 1: Studying Mysteries in Earth's Atmosphere 20 slides with descriptions and activity book Level: Grades 6–8	100.0-38	**8.50**

Describes the first Atmospheric Laboratory for Applications and Science (ATLAS) mission dedicated to a better understanding of the physics and chemistry of Earth's atmosphere.

*Produced by Finley-Holiday Films

	Item No.	Price
Volcanoes of Hawaii and the Planets 20 slides with descriptions	100.0-41	**8.00**

Compares landforms in Hawaii and on the planets. Prepared for the Hawaii Space Grant College by Peter J. Mouginis-Mark.

Earth Observing System 25 slides with descriptions	100.0-42	**8.50**

Presents a variety of images related to the Earth Observing System, the most ambitious science mission ever undertaken. This slide set is part of the Goddard Space Flight Center's Mission to Planet Earth.

Science From New Worlds 20 slides with descriptions and activity guide	100.0-43	**8.50**

Features some of the best images captured by NASA's spacecraft, including images of comets, asteroids, and planets. Supporting notes provide background on the history of planetary exploration and information on major discoveries.

Exploration of Venus 20 slides with descriptions	100.0-44	**8.50**

Traces the history of the exploration of Venus from ground-based observations with telescopes, through radar measurements from Earth, to the Mariner, Pioneer, Venera, and Magellan spacecraft that have flown in the past and gone into orbit around the planet. Prepared by the Solar System Exploration Division at NASA Headquarters.

Microgravity Science 24 slides with descriptions Level: Grades 9–12	100.0-45	**8.50**

Examines many of the microgravity experiments conducted on recent Shuttle missions and the potential benefits this research will have for humankind.

Comet Impact '94 20 slides with descriptions	100.0-46	**8.50**

Features Hubble Space Telescope views of several of the fragment impacts when Comet Shoemaker-Levy 9 collided with Jupiter in July 1994. Includes additional images from other observatories.

Earth/Space Science Slide Set for Educators 122 slides with descriptions Level: Grades 5–Adult	100.0-47	**60.00**

Contains slides and documentation on the most recent space-based observations NASA has obtained regarding Earth system science. The slides are organized around seven themes: Clouds and Radiation; Ocean Productivity, Circulation & Air-Sea Exchange; Greenhouse Gases, Changes in Land Use, Land Cover, Primary Productivity & the Water Cycle; The Role of Polar Ice Sheets & Sea Level; Ozone Depletion; and the Role of Volcanoes in Climate Change.

Item No. **Price**

The Moon: The Geologic History and Future Exploration

36 slides with descriptions and teacher's guide 100.0-48 **15.00**

Emphasizes the Moon's geology, geologic history, and origin. Shows how the astronauts explored the Moon and gives a brief history lesson on what we know about the Moon from telescopic observations. Addresses some of the exciting possibilities that await us when humans return to the Moon to stay. All slides are from NASA, except where noted.

United States Geography: East Coast States, New England to Florida

20 slides with descriptions 100.0-49 **10.00**

Presents photographs taken by astronauts from space aboard the Space Shuttle. Features human-made cities, roads, airports, and dams, as well as natural settings, including oceans, rivers, mountains, and plains. The list accompanying each set contains the photo number by which additional prints can be ordered.

United States Geography: Appalachians, Ohio River Valley, Great Lakes

20 slides with descriptions 100.0-50 **10.00**

Offers photographs taken by astronauts from space aboard the Space Shuttle. Features human-made cities, roads, airports, and dams, as well as natural settings, including oceans, rivers, mountains, and plains. The list accompanying each set contains the photo number by which additional prints can be ordered.

United States Geography: Great Plains and Mississippi River Valley

20 slides with descriptions 100.0-51 **10.00**

Shows photographs taken by astronauts from space aboard the Space Shuttle. Features human-made cities, roads, airports, and dams, as well as natural settings, including oceans, rivers, mountains, and plains.

United States Geography: Rocky Mountains and Southwest

20 slides with descriptions 100.0-52 **10.00**

Offers photographs taken by astronauts from space aboard the Space Shuttle. Features human-made cities, roads, airports, and dams, as well as natural settings, including oceans, rivers, mountains, and plains.

United States Geography: West Coast States, Alaska, and Hawaii

20 slides with descriptions 100.0-53 **10.00**

Presents photographs taken by astronauts from space aboard the Space Shuttle. Features human-made cities, roads, airports, and dams, as well as natural settings, including oceans, rivers, mountains, and plains.

United States Geography: United States Cities

60 slides with descriptions 100.0-54 **26.00**

Shows photographs taken by astronauts from space aboard the Space Shuttle. Features human-made cities, roads, airports, and dams, as well as natural settings, including oceans, rivers, mountains, and plains.

	Item No.	Price
***Galileo Mission to Jupiter**		
20 slides with descriptions	100.0-55	**8.00**

Provides an overview of the Galileo mission prior to the probe's descent. Includes photographs taken during flybys of the Moon, Earth, Gaspra, Ida, and Dactyl. All images in this set are in the public domain.

SIR-C/X-SAR Imaging Radar "Seeing the Earth in a New Way"		
20 slides with descriptions	100.0-56	**8.00**

Features the Spaceborne Imaging Radar-C/X-Band Synthetic Aperature Radar (SIR-C/X-SAR), a joint mission of the German, Italian, and U.S. space agencies that is part of NASA's Mission to Planet Earth. The images contained in this set were collected on two Space Shuttle flights of SIR-C/X-SAR in April and October 1994. All images in this set are in the public domain.

The Ultimate Field Trip: An Astronaut's View of the Earth		
24 slides with descriptions	100.0-57	**8.50**

Includes a collection of 24 views of the Earth witnessed by NASA Astronaut Dr. Kathryn Sullivan while on orbit aboard the Space Shuttle.

***Expanding the Universe With the Hubble Space Telescope II**		
20 slides with descriptions	100.0-58	**8.00**

Offers images from the first 3 years of operation, including planets, stars, and distant galaxies. All images in this set are in the public domain.

***NASA's First Service Mission to the Hubble Space Telescope**		
20 slides with descriptions	100.0-59	**8.00**

Details the most difficult servicing mission ever attempted. The astronaut crew of Endeavour replaced solar arrays and other components to fully restore the telescope's ability to image individual objects in distant crowded fields.

***Expanding the Universe With the Hubble Space Telescope V**		
20 slides with descriptions	100.0-60	**8.00**

Offers spectacular and unaberrated views of the solar system, our Milky Way galaxy, and galaxies beyond. All images in this set are in the public domain.

***Expanding the Universe With the Hubble Space Telescope VI**		
20 slides with descriptions	100.0-61	**8.00**

Provides spectacular images of the cosmos taken with the Hubble Space Telescope, contributing new and comprehensive information about the composition and evolution of the universe. All images in this set are in the public domain.

***Hubble Space Telescope's Greatest Hits**		
20 slides with descriptions	100.0-62	**8.00**

Includes some of the most spectacular images ever captured by the Hubble Space Telescope, including Venus, Saturn, star clusters, black holes, and peculiar galaxies. All images in this set are in the public domain.

*Produced by Finley-Holiday Films

	Item No.	Price
***Manned Space Flights** 20 slides with descriptions	100.0-63	**8.00**

Represents the era of the Mercury, Gemini, Apollo, and Skylab missions, 1961 through the mid-1970's.

***Voyager Mission to Uranus** 20 slides with descriptions	100.0-64	**8.00**

Offers a selection of images of Uranus, its system of rings, and its moons from Voyager 2's encounter with Uranus in 1986.

***Mars the Planet** 40 slides with descriptions	100.0-65	**16.00**

Presents a selection of Viking Orbiter red and violet filter images.

Exploring Meteorite Mysteries 48 slides with descriptions Level: Grades 5–12	100.0-66	**12.00**

Highlights many of the meteorites that have been collected and studied by scientists. Also discusses impact craters and the classification and formation of meteorites.

The Hubble Space Telescope 1996 30 slides with descriptions	100.0-67	**35.00**

Includes detailed views of Earth's neighboring planets, Martian dust storms, Saturn's ring plane, the surface of Pluto, the Helix Nebula, the Crab Nebula, and more. Produced by the Astronomical Society of the Pacific.

The Search for Planets Around Other Stars 30 slides with descriptions	100.0-68	**35.00**

Explains the methods used to detect planetary bodies that orbit nearby stars. Includes artist's impressions of how some of these planetary bodies might look. Inspired by the recent discoveries of Dr. Geoff Marcy and Paul Butler. Produced and copyrighted by the Astronomical Society of the Pacific.

***Mars Pathfinder/Sojourner Return to the Red Planet** 20 slides with descriptions	100.0-69	**8.00**

Contains an assortment of slides highlighting prelaunch preparations, trajectory, and launch and landing activities for Mars Pathfinder and Sojourner. Produced by the Finley Holiday Film Corporation. No copyright protection is asserted for these images. Photo credits to read "NASA/JPL" unless otherwise noted.

***Mars Pathfinder/Sojourner Success, July 1997** 20 slides with descriptions	100.0-70	**8.00**

Provides the first images of the rocky, barren Martian world. Images include the two double hills called "Twin Peaks" and the rocks "Yogi" and "Barnacle Bill." Produced by the Finley Holiday Film Corporation. No copyright protection is asserted for these images. Photo credits to read "NASA/JPL" unless otherwise noted.

*Produced by Finley-Holiday Films

	Format	Item No.	Price

*Expanding the Universe With the Hubble Space Telescope VIII

1996	20 slides	100.0-71	**8.00**

Contains images of dramatic changes on some of the planets within our solar system, star-forming jets, planetary nebulae, and the ancient asteroid Vesta.

*Expanding the Universe With the Hubble Space Telescope IX

1996	20 slides	100.0-72	**8.00**

Contains images of Saturn's ring system, Jupiter's volcanic moon Io, Comet Hale-Bopp, and stellar "eggs" in M16, the Eagle nebula.

*Expanding the Universe With the Hubble Space Telescope X

1996	20 slides	100.0-73	**8.00**

Contains images of the Orion Nebula, Hubble Deep Field, the Egg Nebula, and Comet Hyakutake.

*Expanding the Universe With the Hubble Space Telescope XI

1997	20 slides	100.0-74	**8.00**

Contains images of Jupiter, Comet P/Shoemaker-Levy 9, Uranus, and the Crab Nebula. Also includes the Hubble's 100,000th exposure in July 1996, a snapshot of a distant quasar.

*Expanding the Universe With the Hubble Space Telescope XII

1997	20 slides	100.0-75	**8.00**

Contains images of distant galaxies, Jupiter's volcanic moon Io, quasars, the Cartwheel galaxy, and Supernova 1987 and its neighborhood.

*Hubble Space Telescope's Second Servicing Mission XIII

1997	20 slides	100.0-76	**8.00**

Chronicles the second Hubble servicing mission from the liftoff of Space Shuttle *Discovery* to the first images of Supernova 1987A as seen with the Hubble's new spectrograph.

*Expanding the Universe With the Hubble Space Telescope XIV

1997	20 slides	100.0-77	**8.00**

Contains images of the first direct look, in visible light, at a neutron star, as well as many Mars images, including the season retreat of Mars' north polar cap.

*Expanding the Universe: Deep Space & Planets Set XV

1997	20 slides	100.0-78	**8.00**

Contains images of Saturn's aurora, the glowing outer ring around Supernova 1987A, and the birth of planetary nebulae as they emerge from their cocoons of gas and dust.

*Produced by Finley-Holiday Films

	Item No.	Price
Galileo Mission to Jupiter: Volume 2		
20 slides with descriptions	100.0-79	**8.00**

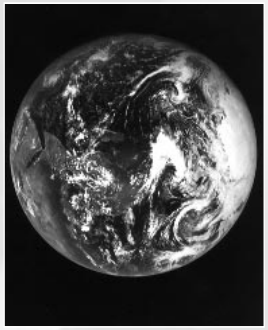
During its first year of residence in the Jovian system, Galileo had two close encounters with Ganymede, one with Callisto, close passes above Jupiter itself, and a Europa flyby shortly thereafter. The images in the set, though not a complete record of Galileo's travels to date, provide an overview of some of Galileo's most intriguing views of Jupiter and its satellites. Manufactured by Finley-Holiday Film Corporation. No copyright protection is asserted for these images.

Galileo Mission to Jupiter: Volume 3		
20 slides with descriptions	100.0-80	**8.00**

This slide set features images acquired by Galileo's Solid State Imaging System during the third through sixth orbits around Jupiter. It includes the highest-resolution prime-mission data of the icy satellite Callisto, pictures from two close fly-bys of Europa, images of volcanic eruptions on Io, photos of Jupiter's complex and turbulent atmosphere, and a rare image of Jupiter's slender ring system. Manufactured by Finley-Holiday Film Corporation. No copyright protection is asserted for these images.

Computer Materials





	Format	Item No.	Price

EOS I Program: Laserdisc, Computer Software, and Booklet

Complete Package (1st Laserdisc Program) 400.0-60 **55.00**

Covers missions STS-1 through STS-44.

EOS II Program: Laserdisc, Computer Software, and Booklet

Complete Package 400.0-61 **55.00**

Earth Observation Images

STS missions flown from January 1992 through September 1993

Press Release Images

Mercury through STS-51 (September 1993)

Provides the second in a series of laserdiscs produced by the Image Sciences Division Center Operations Directorate of the NASA Johnson Space Center. Contains approximately 5,500 Earth-looking still images taken during Shuttle missions STS-42 through STS-51 (1992–1993), as well as nearly 8,800 press release images covering the history of NASA's manned space program from Mercury through STS-51 (1961–1993). The images are grouped according to missions, with crew portraits and mission patches preceding the imagery from each mission. Includes the Guide to Images booklet and IBM-compatible data diskettes containing the image description database.

	Format	Item No.	Price
Our Solar System	Mac/Windows 3.1	400.0-73	**25.00**

Offers an interactive exploration of the universe. More than 200 high-resolution images have been used to create this sight-and-sound voyage through space. Plays on either Mac or PC computers or TV-based CD players. Copyrighted by Finley Holiday Film Corporation.

Spaceborne Imaging Radar—Seeing the Earth in a New Way	Mac/Windows 3.1/ Unix	400.0-75	**6.00**

Contains radar images of sites around the world as seen before and during the SIR-C missions of 1994. The CD–ROM contains handheld photographs from the Space Shuttle, QuickTime movies from the missions, and photographs from the ground. Using captivating examples such as the mountain gorilla habitats of Rwanda, a radar-generated flyby of the Galapagos Islands, the discovery of the Lost City of Ubar in the Arabian desert, and many others, the CD–ROM puts our Earth at students' fingertips. Teachers may use the CD–ROM in many ways, from activities as simple as viewing pictures or as complicated as performing science experiments with real data taken from Earth orbit. Students can learn about NASA's Mission to Planet Earth and imaging radar through the structured lesson plans or think up their own experiments and analyze radar image data from the SIR-C missions. This CD–ROM includes the Netscape World Wide Web browser interface. If your computer has Internet access, there are links provided to a companion "Home Page" to this CD–ROM, as well as to other NASA educational resources. The CD–ROM, produced by NASA's Jet Propulsion Laboratory, was designed for use by students at middle schools, high schools, and colleges. It was especially prepared for PC-compatible computers; however, it is ISO-9660 compliant, which means it is readable on Macintosh and Unix machines. Visit the web site at *http://southport.jpl.nasa.gov/html/cdrom.html*

Welcome to the Planets	Mac/Windows 3.1	400.0-74	**6.00**

Contains 190 selected images acquired over approximately 20 years of NASA planetary exploration. Images of all the planets, as well as comets, asteroids, meteorites, and lunar samples, are accompanied by information about the solar system bodies and the spacecraft that acquired the data. This was designed to provide an overview of planetary exploration at the high school and college levels. The CD–ROM runs on either Mac or Windows systems. A teacher's guide is included. For public and educational use only. A product of NASA's Planetary Data System.

	Format	Item No.	Price

The Hubble Library of Electronic PictureBooks

Mac/Windows 3.1/ Windows '95	400.0-70	**39.95**

Welcomes you to the next millennium with an escorted tour of our solar system, a trip to the mountains of Venus, a walk on the Moon with Neil Armstrong, and a long, deep view into the wilderness of space. Expand your knowledge of the universe and prepare for the discoveries to come, with spectacular pictures from the Hubble Space Telescope, interplanetary spacecraft, astronaut-held cameras, and more. With nearly 500 color images, descriptive captions, and more than 25 minutes of exciting digital video from space, provides an opportunity for you to explore the mysteries and marvels of our cosmic neighborhood, as well as the deepest reaches of space. Includes 16 programs and a free screen saver. The CD contains these Electronic PictureBooks:

Gems of Hubble
The Impact Catastrophe That Ended the Mesozoic Era
Comparing Earth and Its Planetary Neighbors
The Red Planet: A Survey of Mars
Volcanic Features of Hawaii and Other Worlds
Endeavour Views the Earth
Scientific Results From the GHRS
Clementine Explores the Moon
Windows on Orion
The Planetary System
Magellan Highlights of Venus
Apollo 11 at Twenty-Five
Planetquest
Space Art by Kids
Other Worlds From Earth
Images of Mars

Winds of Change: An Educational CD–ROM From the NASA Scatterometer Project

Mac/Windows 3.1	400.0-76	**5.00**

Provides students a curriculum resource for thematic, interdisciplinary instruction, and self-investigation of global climate Earth science activities. Includes information about NASA's Scatterometer (NSCAT), a specialized microwave radar that will measure the speed and direction of winds over the global ocean surface to help predict weather patterns and climate systems. Copyrighted by the California Institute of Technology. For more information, contact their web site at http://stargate.jpl.nasa.gov/~support/index.html or send e-mail to support@stargate.jpl.nasa.gov.

Earth Observatorium: Mission to Planet Earth

Mac/Windows 3.1/ Windows '95	400.0-77	**24.00**

Lets you look out a porthole of the Space Shuttle Endeavour during mission STS-68 to view 12,500 images of Earth, plus many of the radar images taken during the flight. A navigation interface lets you view images by timeline, country, geographic location, or photo ID. The astronauts discuss the flight's results in a 16-minute movie. Published and copyrighted by Rocky Mountain Digital Peeks. Volume 2: For Windows 3.1, Windows 95, or Macintosh OS (Sys 7+), this multimedia CD–ROM works best using a 16- or 24-bit color display with 5 MB for the application.

	Format	Item No.	Price
Views of the Solar System	Mac/Windows 3.1/ Windows '95	400.0-78	**21.95**

Offers an extraordinary collection of images, animations, facts, and historical perspectives about the planets, moons, Sun, and other parts of our solar system. Includes a section with NASA-developed activities and National Science Teachers Association journal articles for educators. For a preview of the CD–ROM, visit *http://www.nsta.org/pubs/special/pb128x.htm*. Copyrighted by the National Science Teachers Association.

The Heart in Space

Level: Grades 9–12 Mac/Windows 3.1 400.0-80 **5.00**

Examines interactively how microgravity affects the cardiovascular system. Covers basic anatomy and functions of the human heart. Also presents research findings about how scientists are addressing human physiology in space. Produced by the STELLAR Multimedia Curriculum project at the NASA Ames Research Center. Information about this CD-ROM can be obtained from http://stellar.arc.nasa.gov. For Macintosh 7.0 or greater; PC—386 processor/Windows 3.1 or greater.

Exploring the Internet	Mac/Windows 3.1/ Windows '95	400.0-81	**5.00**

Explains what the Internet is, how to get connected, and how to explore the World Wide Web. You will get hands-on experience navigating the Internet and discover its many uses. A fantasy voyage through the universe makes this CD fun for young users and adults alike. Produced and copyrighted by BDM Interactive.

PC's in Space	Windows '95	400.0-82	**6.00**

Offers an exciting collection of seven software programs, including:

Exploring the Earth
Exploring the Sun
Exploring the Solar System
Exploring the Universe
Exploring North and South America
The Hubble Space Telescope First Servicing Mission
Exploring the States

PC's in Space was produced by Jackson and Tull as a community outreach service to encourage student interest in space exploration. The software and manuals are free on the Internet. For more information, visit *http://muspin.gsfc.nasa.gov/pcinspace.html*. For technical support, e-mail *pcinspace@jnt.com* or call 1-800/375-2344.

Deep Space: Featuring the Hubble Space Telescope Images	Mac/Windows 3.1/ Windows '95	400.0-83	**25.00**

Provides an interactive menu that allows you to select from categories of deep space objects, such as galaxies and star clusters. Includes a complete collection of Hubble images from the Space Telescope Science Institute, sixteen planet views, and a glossary. Produced and copyrighted by Finley-Holiday Film Corporation.

	Format	Item No.	Price

Space Shuttle Flights: 100 Stock Photos

Mac/Windows 3.1/ Windows '95	400.0-84	**15.00**

Offers a collection of digital color photos selected from thousands of NASA images covering Shuttle missions from the first flight in 1981 to the second Hubble Space Telescope Servicing Mission in 1997. Includes photos of the Space Shuttle, astronauts in space, satellite launches, Earth from the Shuttle, and more. Compiled by Finley-Holiday Film Corporation. No copyright asserted for the images on this disc.

Pathfinder and the Best of Mars

Mac/Windows 3.1/ Windows '95	400.0-85	**20.00**

Provides a stunning collection of Pathfinder images of Mars and includes the best Mars images from all the Mars missions, including Mariner, Viking, and Hubble views. As a special bonus, the CD includes 5 motion video clips and 20 3-D images to view with enclosed 3-D glasses. Image Browser software allows the viewer to easily review photos, read the captions, and print them for handy reference. PC: Windows 3.x or Windows '95/NT with at least 8 MB of RAM. Macintosh: System 7.1 or later with 3 MB free of RAM.

Hubble Telescope CD–ROM

Mac/Windows 3.1/ Windows '95	400.0-86	**20.00**

Features more than 200 digital Hubble images released by the Space Telescope Science Institute and includes a Screen Saver and Image Browser software for the viewer to easily review the photos, read and search the captions, and print for handy reference. PC: Windows 3.x or Windows '95/NT with at least 8 MB of RAM. Macintosh: System 7.1 or later with 3 MB free of RAM.

Geomorphology From Space: A Global Overview of Regional Landforms

Mac 7.1/ Windows 3.1/UNIX/1986	400.0-87	**5.00**

Offers a CD–ROM version of an out-of-print 1986 NASA publication. This resource is a study of landforms and landscapes, including the description, classification, origin, development, and history of planetary surfaces. The core of the material is a gallery of space imagery consisting of 237 plates, each treating some geographic region where a particular landform theme is exemplified. Commentary, photographs, locator maps, and sometimes a geologic map accompany each plate. A web version of this CD–ROM is available at *http://daac.gsfc.nasa.gov/DAAC_DOCS/daac_ed.html*

Mars VE: The Virtual Exploration Mission

Level: Grades 5–8	Mac/Windows 3.1/ Windows '95	400.0-88	**5.00**

Serves as a curriculum supplement that allows students to understand basic concepts of space exploration and the search for life in the universe. Students are divided into teams and assigned a research category in which they will virtually explore four Mars landing sites. Includes a printable teacher's guide and student logbook, which provides additional content and interdisciplinary classroom activities. This interactive program emphasizes hands-on experience, critical thinking, problem solving, and collaboration within teams. Visit the web site at *http://www.exploringspace.arc.nasa.gov/vecd.htm*

	Format	Item No.	Price
Glacier Power	Mac	400.0-89	**5.00**

Serves as a curriculum supplement that includes information on glaciers and their importance to climate studies. The CD includes lesson plans, student review exercises, activities and resources such as glacier imagery, satellite imagery, illustrations, diagrams, and more. Available on-line at *http://www.asf.alaska.edu:2222/*

Arctic Observatory/Sea Ice in the Polar Regions	Mac/Windows 3.1/ Windows '95	400.0-90	**5.00**

Arctic Observatory—Interactively addresses Arctic phenomena and processes, allowing students to ask and answer questions about interrelationships among several physical aspects of the Arctic system. A printable teacher's guide is included on the CD. Sea Ice in the Polar Regions—Describes sea ice classification, observation, and climate impacts. Both resources can be downloaded from h*ttp://www.usra.edu/esse/learnmod.html*

Exploring Aeronautics Level: Grades 5–8	Mac/Windows 3.1/ Windows '95	400.0-91	**5.00**

Offers an introduction to aeronautics, covers the fundamentals of flight, contains a historical timeline, examines different types of aircraft, and teaches students to use the tools of aeronautics used by researchers to test aircraft designs. For more information, visit the web site at *http://exploringaerospace.arc.nasa.gov*

Visit to an Ocean Planet Level: Grades 5–12/1998	Windows 3.1/ Windows '95/Mac	400.0-92	**5.00**

Interactive, educational CD-ROM that reveals the importance of our oceans to global climate and life. Allows users to explore the Gulf of Mexico with satellite data, investigate the 1997-98 El Niño, discover "what's up" with Earth-orbiting satellites, and learn about the research activities of real life oceanographers. The curriculum background materials are arranged in the context of widely accepted teaching themes. The CD-ROM also highlights results from the TOPEX/Poseidon project. Copyright 1998 California Institute of Technology and its licensors. U.S. Government sponsorship acknowledged. All rights reserved.

Remote Sensing Tutorial		400.0-93	**5.00**

Remote sensing involves the use of instruments or sensors to "capture" the spectral and spatial relationships of objects and materials observable at a distance, typically from above them. This tutorial will help the viewer understand how remote sensing is applied to studying the land, sea, and air making up the environments of our planet. It is intended to inform both professionals and the general public about the principles and achievements of remote sensing, with emphasis on applications already demonstrated and to point to the anticipated functions and benefits of Earth Science initiatives. The program uses Landsat, SPOT, and several radar systems to provide most of its examples of commonly used space imagery.

	Format	Item No.	Price

The Dynamic Sun

Level: Grades 5–12/1998 Windows '95/Mac 400.0-94 **5.00**

"The Dynamic Sun" is a multimedia educational presentation on the Sun and its effects on the Earth. This CD-ROM contains a presentation in Adobe Acrobat PDF format complete with 66 slides. The purpose is to educate, engage, and develop student interest in the Sun and in exploring science. Shows images and video clips on the Sun from SOHO (Solar and Heliospheric Observatory), presents factual information on the Sun and sun-related topics, explains Sun features including sun spots, shows how explosions on the sun occur and effect the Earth (auroral lights, power outages, etc.), and details Sun study projects.

An Interactive Guide to the X-34 Program's History, Technology, and Achievements

Level: Grades 5–12/1999 CD-ROM 400.0-95 **5.00**

The X-34 is a reusable, suborbital, air-launched vehicle designed to fly at speeds approaching Mach 8 and at altitudes up to 50 miles. The main priority of NASA's reusable launch vehicle program is to reduce the cost of access to space. The X-34 program is an important link in this effort as a proving ground for new technologies and concepts. This CD explores the history, personalities, technology, and future of the X-34 as well as related programs.

New CD-ROM Programs

Remembering Apollo 11–The 30th Anniversary Data Archive CD-ROM

Level: Grades 9 - Adult/1999 WIN '95/Power MAC 400.0-96 **5.00**

This CD-ROM is intended as a collection of hard-to-find technical data and other interesting information about the Apollo 11 mission, as well as the Apollo program in general. It includes basic overviews, such as a retrospective analysis, an annotated bibliography, and history of the lunar orbit rendezvous concept. It also contains technical data, such as mission operations reports, press kits, and news references for all of the Apollo missions, the Apollo spacecraft, and the Saturn V launch vehicle. Rounding out this CD-ROM are extensive histories of the Lunar Orbiter program (the robotic predecessor to Apollo), biographies of the Apollo astronauts and other key individuals, and interesting audiovisual materials, such as video and audio clips, photo galleries, and blueprint-like diagrams of the Apollo spacecraft.

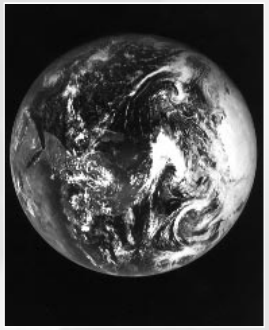
Climate Change Presentation Kit

WIN '95 400.0-97 **5.00**

This CD-ROM is offered as a resource to help prepare talks for students or the general public. The toolkit allows teachers the option of picking and choosing the components that they would need to communicate climate change issues to audiences. It contains fact sheets, a power point slide presentation, and interactive activities that are designed to interest audiences of all levels. It contains the essentials for brief presentations on the complicated issue of climate change. It communicates the information in a way that is easy to understand. The CD provides basic information on climate and weather and then provides straightforward answers to potentially confusing questions regarding global warming.

NASA Memorabilia/Miscellaneous



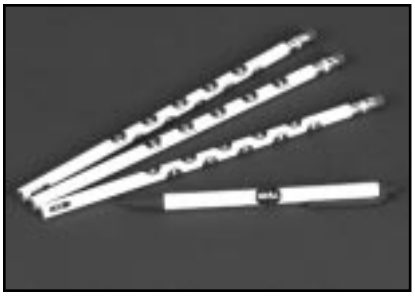


Wonderful Gifts for Space Enthusiasts! Inexpensive Awards for Students! Great Ideas for Class Projects!

006.3-07P Toys in Space I Activity Kit
(10 toys–to accompany "Toys In Space" videotape)*

300.0-13 Space Shuttle Eraser
(assorted colors)

300.0-34 NASA Logo Water Bottle



300.0-06 NASA Vector Logo Pen
300.0-07 NASA Vector Logo Pencil

006.3-12P Toys in Space Activity Kit II
(7 toys–to accompany "Physics of Toys" videotape)*

300.0-32 NASA Logo Notebook
300.0-35 Earth Playing Cards
300.0-37 NASA Vector Key Chain

300.0-09 Astronaut Ice Cream
(all natural neapolitan flavor)

300.0-17 Space Shuttle Woodkit with Decals
(for older students, glue not included)

300.0-12 Full-Stack Shuttle
300.0-16 Die-Cast Metal Shuttle
300.0-36 Stealth Fighter Jet

300.0-18 Saturn V Replica with Apollo Patch
300.0-19 Shuttle Astronaut Replica with NASA Vector Patch
300.0-24 Space Shuttle Replica with Shuttle Patch
300.0-33 John Glenn Mercury Astronaut Replica with Friendship 7 Patch

300.0-04G NASA Vector Logo Hat
(green and navy)
300.0-04B NASA Vector Logo Hat
(khaki and black)
Brushed twill with embroidered design

300.0-05I International Space Station
300.0-05H NASA Hubble Space Telescope
300.0-05V NASA Vector Patch
300.0-05F American Flag Patch
300.0-05S Space Shuttle Patch

*Contents of Toy Kits may differ slightly from photo. Toys subject to availability.

Item No.	Description	Ordering Info	Price
300.0-04B	NASA Vector Logo Hat	Khaki and Black	**10.00**
300.0-04G	NASA Vector Logo Hat	Green and Navy	**10.00**
300.0-05V	NASA Vector Patch		**2.00**
300.0-05S	Space Shuttle Patch		**2.00**
300.0-05F	American Flag Patch		**2.00**
300.0-05H	NASA Hubble Space Telescope Patch	Red, Blue, and Gold	**3.50**
300.0-05I	International Space Station Patch	U-shaped, Multi-colored	**3.50**
300.0-06	NASA Vector Logo Pen		**0.80**
300.0-07	NASA Vector Logo Pencil		**0.25**
300.0-09	Astronaut Ice Cream		**1.75**
300.0-12	Full-Stack Space Shuttle Pencil Sharpener		**2.00**
300.0-13	Space Shuttle Eraser		**0.50**
300.0-16	Die-Cast Metal Shuttle Pencil Sharpener		**2.00**
300.0-17	Space Shuttle Woodkit with Decals		**3.00**
300.0-18	Saturn V Replica with Apollo Patch		**12.00**
300.0-19	Shuttle Astronaut Replica with NASA Vector Patch		**12.00**
300.0-24	Space Shuttle Replica with Shuttle Patch		**12.00**
300.0-31	NASA Logo Lapel Pin (Excellent as a tie-tack or for use as a lapel pin)		**2.00**
300.0-32	NASA Logo Notebook (80-sheet, college-ruled, micro-perforated)		**2.00**
300.0-33	John Glenn Mercury Astronaut Replica w/Mercury Patch		**12.00**
300.0-34	NASA Logo Water Bottle		**2.50**
300.0-35	Earth Playing Cards		**2.50**
300.0-36	Stealth Fighter Jet Pencil Sharpener		**2.00**
300.0-37	NASA Vector Key Chain		**2.50**
006.3-07P	*Toys in Space Activity Kit I	10-piece kit	**30.00**
006.3-12P	*Toys in Space Activity Kit II	7-piece kit	**25.00**

*Selected individual toys also available, see page 117.

	Format	Item No.	Price

Toys in Space Activity Kit

10-piece set	006.3-07P	**30.00**

Contains the ten toys Shuttle astronauts carried with them on mission 51-D. It is designed to be used with the "Toys in Space" videotape programs on microgravity. Contains the following toys: top, ball and jacks, slinky, yo-yo, gyroscope, paddleball, flipping toy, car and track, magnetic marbles, and wheelo.

Toys in Space II Activity Kit

7-piece set	006.3-12P	**25.00**

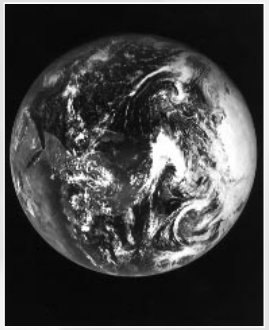
Contains seven of the toys Shuttle astronauts carried with them on mission STS-54. It is designed to be used with the "Physics of Toys in Space" and "Toys in Space II" videotape programs on microgravity. Contains the following toys: car and track, basketball with hoop, magnetic marbles, swimming toy, gravitron, flipping toy, and balloon helicopter.

Toys in Space—Individual Toys (sold separately)

Gyroscope	300.0-25	**5.00**
Car and Track	300.0-26	**6.00**
Magnetic Marbles	300.0-27	**2.00**
Wheelo	300.0-28	**3.00**
Gravitron	300.0-29	**7.00**
Balloon Helicopter	300.0-30	**1.00**

NASA Educator Resource Centers





NASA Educator Resource Center Network

To help disseminate educational materials, NASA's Education Division has established the NASA Educator Resource Center Network. In addition to the Educator Resource Centers listed below, NASA has formed partnerships with school systems, planetariums, museums, and other nonprofit organizations to serve as Regional Educator Resource Centers.

Educator Resource Centers

AL, AR, IA, LA, MO, TN
U.S. Space and Rocket Center
NASA Educator Resource Center
One Tranquility Base
Huntsville, AL 35758
256/544-5812

AK, AZ, CA, HI, ID, MT, NV, OR, UT, WA, WY
NASA Ames Research Center
NASA Educator Resource Center
Mail Stop 253-2
Moffett Field, CA 94035-1000
650/604-3574

NASA JPL Educator Resource Center
Village at Indian Hill
1460 East Holt Avenue, Suite 20
NASA Jet Propulsion Laboratory
Pomona, CA 91767
909/397-4420

California cities near Dryden Flight Research Center
NASA Dryden Flight Research Center
NASA Educator Resource Center
45108 North Third Street East
Lancaster, CA 93535
661/948-7347

FL, GA, PR, VI
NASA Kennedy Space Center
NASA Educator Resource Center
Mail Code ERC
Kennedy Space Center, FL 32899
407/867-4090

CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT
NASA Goddard Space Flight Center
NASA Educator Resource Center
Mail Code 130.3
Greenbelt, MD 20771
301/286-8570

MS
NASA Stennis Space Center
NASA Educator Resource Center
Building 1200
Stennis Space Center, MS 39529-6000
228/668-3220

IL, IN, MI, MN, OH, WI
NASA John H. Glenn Research Center
NASA Educator Resource Center
21000 Brookpark Road, MS 8-1
Cleveland, OH 44135
216/433-2017

CO, KS, NE, NM, ND, OK, SD, TX
Space Center Houston
NASA Educator Resource Center
1601 NASA Road One
Houston, TX 77058
281/244-2129

NASA GSFC Wallops Flight Facility
NASA Educator Resource Center
Visitor Center
Building J-17
Wallops Island, VA 23337
757/824-2298

KY, NC, SC, VA, WV
Educator Resource Center for NASA LaRC
Virginia Air and Space Center
600 Settlers Landing Road
Hampton, VA 23669-4033
757/727-0900, ext. 757

NASA Regional Educator Resource Centers

Alaska Science Center
Alaska Pacific University
NASA Educator Resource Center
4101 University Drive
Anchorage, AK 99508
907/564-8258

University of Arkansas/Little Rock
NASA Educator Resource Center
Star Project–Planetarium
2801 South University/FH215
Little Rock, AR 72204
501/569-3259

University of Arizona
NASA Educator Resource Center
Lunar and Planetary Laboratory
Space Sciences Building
1629 E. University Boulevard
Tucson, AZ 85721
520/621-6947

California State University, Fresno
NASA Educator Resource Center
NASA SJV RERC, M/S 01
5005 N. Maple Avenue
Fresno, CA 93740-8025
209/278-0355

California Science Center
NASA Educator Resource Center
700 State Drive
Los Angeles, CA 90037
213/744-7418

Endeavour Center
Vandenberg Air Force Base
One Carob Street
Vandenberg AFB, CA 93437
805/734-1747

U.S. Space Foundation
2860 S. Circle Drive, Suite 2301
Colorado Springs, CO 80906
719/576-8000

Eastern Connecticut State University
Aerospace and Environmental Education Research Center
Library Room 144
83 Windham Street
Willimantic, CT 06226
860/465-5725

University of the District of Columbia
4200 Connecticut Avenue, NW-MB 4201
Washington, DC 20008
202/274-6287

National Air and Space Museum
Room P700, MRC 305
Washington, DC 20560
202/357-4223

Delaware Aerospace Center
500 C Duncan Road
Wilmington, DE 19809
302/454-2432

Southern Polytechnic State University
1100 S. Marietta Parkway
Marietta, GA 30060-2896
770/528-6272

State of Hawaii Department of Education
Barbers Point Elementary School
3001 Boxer Road, NAS Barbers Point
Kapolei, HI 96707-2103
808/673-7410

University of Northern Iowa
NASA RERC, 222 S.E.C.
Cedar Falls, IA 50614-0609
319/273-6066

University of Idaho, College of Education
NASA RERC
Moscow, ID 83844-3080
208/885-7536

Museum of Science and Industry
57th Street and Lake Shore Drive
Chicago, IL 60637-2093
773/684-1414, ext. 2426

Science Central
1950 North Clinton Street
Fort Wayne, IN 46805
219/424-2400, ext. 416

Kansas Cosmosphere and Space Center
1100 N. Plum
Hutchinson, KS 67501-1499
316/662-2305, ext. 353

Murray State University
Waterfield Library
Murray, KY 42071-0009
270/762-2850

Bossier Parish Community College
2719 Airline Drive
Bossier City, LA 71111
318/746-9851, ext. 319

Bridgewater State College
Maxwell Library/Media Service
Bridgewater, MA 02325
508/697-1248, ext. 2022

Central Michigan University
SMTC/NASA RERC
101 Ronan Hall
Mount Pleasant, MI 48859
517/774-4387

Northern Michigan University
The Seaborg Center
1401 Presque Isle
Marquette, MI 49855-5394
906/227-2002

Oakland Schools Science Mathematics
and Technology Center
1408 Scott Lake Road
Waterford, MI 48328
248/683-7476

Mankato State University
Box 52, Armstrong Hall
Mankato, MN 56002-8400
507/389-5711

St. Cloud State University
Center for Information Media
720 Fourth Avenue South S/CH-29
St. Cloud, MN 56301-4498
320/255-2062

Southeast Missouri State University
One University Plaza
222 N. Pacific Street
Cape Girardeau, MO 63703
573/290-5255

Choctaw Teacher Enhancement Center
Route 7, Box 72
Philadelphia, MS 39350
601/650-9320

Western Montana College
Carson Library/NASA RERC
710 S. Atlantic
Dillon, MT 59725
406/683-7492

University of N. Carolina–Charlotte
CIMC/Atkins Library
Charlotte, NC 28223
704/547-2559

University of North Dakota
Center for Aerospace Science
University Station, Box 9008
Grand Forks, ND 58202-9008
701/777-4856

University of Nebraska State Museum
14th and U Streets
135 Morrill Hall
Lincoln, NE 68588-0374
402/472-4525

University of Nebraska at Omaha
DSC 118
6001 Dodge Street
Omaha, NE 68182-0266
888/866-6272

Georgian Court College Library
900 Lakewood Avenue
Lakewood, NJ 08701-2697
732/364-2200, ext. 419

New Mexico State University
Wells Hall, Bay 4
Las Cruces, NM 88003-0001
505/646-6414

Community College of Southern Nevada
3200 East Cheyenne Avenue C2A
N. Las Vegas, NV 89030-4296
702/651-4505

Cohen Library-CCNY
NAC 5302
138th Street & Convent Avenue
New York, NY 10031
212/650-6993

University of Cincinnati
Curriculum Resources Center
600 Blegen Library
Cincinnati, OH 45221-0219
513/556-1430

Eisenhower National Clearing House
1929 Kenny Road
Columbus, OH 43210-1079
614/292-8389

Oklahoma State University
OSU/Aerospace Professional Development Center
308-A CITD Building
Stillwater, OK 74078-8089
405/744-6784

Oregon Museum of Science and Industry
1945 S.E. Water Avenue
Portland, OR 97214
503/797-4551

University of Pittsburgh
4H17 Forbes Quad
230 S. Bouquet Street
Pittsburgh, PA 15260
412/648-7558

University of Puerto Rico at Mayaguez
Resource Center for Science and Engineering
Physics Building Office #200
Mayaguez, PR 00680
787/831-1022

Rhode Island College
Physical Science Department
600 Mount Pleasant Avenue
Providence, RI 02908
401/456-9638

Stanback Planetarium
South Carolina State University
300 College Street, Box 7636
Orangeburg, SC 29117-7636
803/536-8711

University of Tennessee at Martin
Center for Excellence in Science/Math Education
145 Gooch Hall
Martin, TN 38238
901/587-7907

University of Texas at Brownsville
80 Fort Brown TSC Library
Brownsville, TX 78520
956/544-8220

Utah State University
Adele & Dale Young Education Technology Center
170 Old Main Hill, 2845 University Boulevard
Logan, UT 84322-2845
435/797-3377

Weber State University
NASA ERC LL230
2509 University Circle
Ogden, UT 84408-2509
801/626-6590

Radford University
Tyler Avenue/Walker Hall
Norwood Street/Box 6999
Radford, VA 24142
540/831-6284

University of Washington
Space Grant Program
352 Johnson Hall, Box 351650
Seattle, WA 98195
206/543-1943

University of Wisconsin–La Crosse
Science Resource Center/NASA Room
1725 State Street, Murphy Library, Room 270
LaCrosse, WI 54601
608/785-8148

WVU/NASA Ames IV & V Facility
100 University Drive
Fairmont, WV 26554
304/367-8436

University of Charleston
125 Riggleman Hall
2300 MacCorkle Avenue, SE
Charleston, WV 25304
304/357-4773

Wheeling Jesuit University
Classroom of the Future
316 Washington Avenue
Wheeling, WV 26003
304/243-2401

University of Wyoming
Learning Resource Center
Education Building, Room 222
Laramie, WY 82070
307/766-2527

NASA's Education Home Page

NASA's Education Home Page serves as a cyber-gateway to information regarding educational programs and services offered by NASA for educators and students across the United States. This high-level directory of information provides specific details and points of contact for all of NASA's educational efforts and Field Center offices.

Educators and students utilizing this site will have access to a comprehensive overview of NASA's educational programs and services, along with a searchable program inventory that has cataloged NASA's educational programs. NASA's on-line resources specifically designed for the educational community are highlighted, as well as home pages offered by NASA's four areas of research and development (including the Aero-Space Technology, Earth Science, Human Exploration and Development of Space, and Space Science Enterprises).

Visit this resource at the following address: ***http://education.nasa.gov***

NASA Spacelink

NASA Spacelink is one of NASA's electronic resources specifically developed for the educational community. Spacelink is a "virtual library" in which local files and hundreds of NASA World Wide Web links are arranged in a manner familiar to educators. Using the Spacelink search engine, educators can search this virtual library to find information regardless of its location within NASA. Special events, missions, and intriguing NASA web sites are featured in Spacelink's "Hot Topics" and "Cool Picks" areas.

Spacelink is the official home to electronic versions of NASA's Educational Products. NASA educator guides, educational briefs, lithographs, and other materials are cross-referenced throughout Spacelink with related topics and events. Spacelink is also host to the NASA Television Education File schedule. NASA Educational Products can be accessed at the following address: ***http://spacelink.nasa.gov/products***

Educators can learn about new NASA Educational Products by subscribing to Spacelink EXPRESS. Spacelink EXPRESS is an electronic mailing list that informs subscribers quickly by e-mail when new NASA educational publications become available on Spacelink.

Spacelink may be accessed at the following address: ***http://spacelink.nasa.gov***

Join the NASA Spacelink EXPRESS mailing list to receive announcements of new NASA materials and opportunities for educators. Our goal is to inform you as quickly as possible when new NASA educational publications become available on Spacelink: ***http://spacelink.nasa.gov/xh/express.html***

NASA Television (NTV)

NASA Television (NTV) features Space Shuttle mission coverage, live special events, interactive educational live shows, electronic field trips, aviation and space news, and historical NASA footage. Programming has a 3-hour block—Video (News) File, NASA Gallery, and Education File—beginning at noon Eastern and repeated three more times throughout the day.

The Education File features programming for teachers and students on science, mathematics, and technology, including NASA. . . On the Cutting Edge, a series of educational live shows. Spacelink is also host to the NTV Education File schedule at: ***http://spacelink.nasa.gov/NASA.News/***

These interactive live shows let viewers electronically explore the NASA Centers and laboratories or anywhere scientists, astronauts, and researchers are using cutting-edge aerospace technology. The series is free to registered educational institutions. The live shows and all other NTV programming may be taped for later use.

NTV Weekday Programming Schedules (Eastern Times)

Video File	NASA Gallery	Education File
12–1 p.m.	1–2 p.m.	2–3 p.m.
3–4 p.m.	4–5 p.m.	5–6 p.m.
6–7 p.m.	7–8 p.m.	8–9 p.m.
9–10 p.m.	10–11 p.m.	11–12 p.m.

Live feeds preempt regularly scheduled programming. Check the Internet for program listings at:
http://www.nasa.gov/ntv/
NTV Home Page
http://www.nasa.gov/
Select "Today at NASA" and "What's New on NASA TV?"
http://spacelink.nasa.gov/NASA.News/
Select "TV Schedules"

Via satellite—GE-2 Satellite, Transponder 9C at 85 degrees West longitude, vertical polarization, with a frequency of 3880.0 megahertz (MHz) and audio of 6.8 MHz—or through collaborating distance learning networks and local cable providers.

For more information on NTV, contact:
NASA TV
NASA Headquarters
Code P-2
Washington, DC 20546-0001
Phone: (202) 358-3572

For more information on the Educational Live Shows, contact:
NASA. . . On the Cutting Edge
NASA Teaching From Space Program
308-A, Watkins CITD Building
Oklahoma State University
Stillwater, OK 74078-8089
E-mail: *edge@aesp.nasa.okstate.edu*

NASA's Learning Technologies Project (LTP)

NASA's Learning Technologies Project (LTP) is an Agency asset that includes a suite of Internet projects that teachers and students can use to explore NASA resources and learn about NASA missions. Through "Sharing NASA" on-line—interactive projects available from LTP's Quest server—you have the opportunity to communicate with NASA scientists and researchers and to experience the excitement of science as it is happening.
The Learning Technologies Channel (LTC) allows you to participate in remote events via a multidimensional web experience. E-mail, chat rooms, audio, video, text transcription, synchronized graphics, and sometimes NASA Television are employed to take you to workshops, lectures, seminars, courses, and exciting live events around the world.

Projects of LTP provide on-line resources and activities for the classroom in a number of disciplines and across disciplines. One allows remote access to a telescope over the Internet. Another brings you software tools to help manage the Internet in the classroom. Yet another offers a simulation to teach the basics of aerodynamics.

You can also find information on integrating technology into the classroom and grant opportunities. LTP offers a wide variety of educationally sound, standards-based projects that help you explore science, math, and engineering from your classroom.

Visit the LTP Home Page at: ***http://learn.ivv.nasa.gov***

Find a list of education projects from LTP at: ***http://learn.ivv.nasa.gov/education/topics/education.html***

Stay informed about what's happening in the Sharing NASA program by sending an e-mail message to ***listmanager@quest.arc.nasa.gov***

In the body of the message, type ***subscribe sharing-nasa***.

Stay informed about what's happening on the Learning Technologies Channel by sending an e-mail message to ***listmanager@quest.arc.nasa.gov***

In the body of the message, type ***subscribe updates-ltc***.

Title Index

Title Index

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Title Index

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Worldwide Distribution Center for Aerospace Education Materials

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15181 Route 58 South (440) 775-1400
Oberlin, OH 44074 Fax (440) 775-1460

E-mail Address: *nasaco@leeca.esu.k12.oh.us*— **World Wide Web Address:** *http://core.nasa.gov*

Central Operation of Resources for Educators

Worldwide Distribution Center for Aerospace Education Materials

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Authorized Signature: _____

E-mail Address: _____

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Institution: _____

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Phone: ( ) _____

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(check one) ___ **VISA** ___ **MasterCard**

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$25.01 to $50.00. . . . . add $6.50
$50.01 to $75.00. . . . . add $7.00
Over $75.00 . . . . . add 10%

Contact NASA CORE Office for Additional International Shipping and Customs Charges.

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Ohio Residents Add 5 3/4% Sales Tax	
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15181 Route 58 South
Oberlin, OH 44074

(440) 775-1400
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E-mail Address: *nasaco@leeca.esu.k12.oh.us*— **World Wide Web Address:** *http://core.nasa.gov*